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EDITED BY JACOB VINER AND F. H. KNIGHT, WITH THE CO-OPERATION OF THE OTHER MEMBERS OF THE DEPARTMENT OF ECONOMICS OF THE UNIVERSITY OF CHICAGO

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SOME NOTES ON DUOPOLY AND SPATIAL COMPETITION

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AND
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I

CONSIDERABLE interest has been shown of late both in the problem of space as applied to the market and in the problem of the definition of a commodity. This is because both of these problems are really the same problem. Not only is it often convenient to deal with spatial problems by calling similar things at different places different things, but it has been found very fruitful to discuss differences in the qualities of commodities as if they were differences in location. The most important of the writings on this subject is the well-known article by Professor Hotelling on "Stability in Competition,"[1] but it appears to us that certain errors of Hotelling's are tending to hold up the progress of investigation in this line. A great part of the following notes emerges almost directly from the clearing-away of the belief that sellers always tend to cluster together. We have endeavored

[1] *Economic Journal*, March, 1929.

in this article to examine the conditions under which this will be true, and have worked out some corollaries which are of more general interest.

II

In the article mentioned, Hotelling deals with the location of sources of supply in a market where "the buyers of a commodity [are] uniformly distributed along a line of length l, which may be Main Street in a town or a transcontinental railroad." He wishes to prove the wastefulness of "private profit-seeking management" by showing that the location of the sources will not be at the quartiles of the market, which would "minimise the social cost of transportation," but that, "instead of doing so, they crowd together as closely as possible. Even if A, the first in the field, should settle at one of these points, ... B upon his[2] arrival will not go to the other but will fix upon a location between A and the center and as near A as possible. Thus, some customers will have to transport their goods a distance of more than $\frac{1}{2}l$, whereas with two stores run in the public interest no shipment should be for a greater distance than $\frac{1}{4}l$."[3]

The assumptions explicitly made by Hotelling are as follows:

1. The buyers of the commodity are uniformly distributed along the market.

2. The cost of transport of a unit of product per unit of distance is constant.

3. No buyer has any preference for any particular seller except on the ground of price plus transport costs.[4]

4. Zero cost of production.[5]

[2] Hotelling appears to identify "source" with the firm or entrepreneur.

[3] Hotelling, *op. cit.*, p. 53.

[4] Distance is used as a "figurative term for a great congeries of qualities" which may vary in degree from the state which consumers prefer, for, "in general, there will be many causes leading particular classes of buyers to prefer one seller to another." Transport costs do *not* stand for the cost of changing the quality of the product (as is useful in some other problems) but for the degree of disutility resulting from a consumer getting a commodity more or less different from what he wants. This is because the consumer pays the transport cost himself (which he suffers because the source is not located where he would prefer it, i.e., near himself).

[5] It is sufficient, for all Hotelling's purposes, to assume constant marginal costs and to understand, by "price," demand price, etc., the excess of these over the marginal cost.

5. "Unit quantity of commodity is consumed in each unit of time in each unit of length of line. The demand is thus at the extreme of inelasticity."[6]

6. The transport costs are paid by the buyer. This implies that no seller is able to charge discriminatory prices at works to different buyers. In the absence of this assumption it would be possible, in view of the extreme inelasticity of demand of each buyer, to exercise perfect discrimination.[7]

7. The different sources of supply are owned by different entrepreneurs, who are completely indifferent to each other's gains and losses.

8. In deciding upon his location, B considers A's location as given; and in determining price, each considers the other's price as given.

9. Each source is capable of supplying an indefinitely large output. ("Without effect upon the generality of our conclusions we shall suppose that the cost of production to A and B is zero.")

10. Costs are independent of location.[8]

There remains a further assumption which is not explicitly stated, namely:

11. Transport cost per unit of commodity is independent of the number of units transported.

Hotelling claims that under these circumstances "B will come just as close to A as other conditions permit. Naturally, if A is not exactly in the center of the line, B will choose the side of A toward the more extensive section of the market . . . . to get, so to speak, between one's competitor and a mass of customers."[9]

[6] Hotelling, *op. cit.*, p. 45.

[7] "Perfect discrimination" is the term used by Mrs. J. Robinson in *The Economics of Imperfect Competition* (1933), p. 187 n., for what Professor Pigou calls "discrimination of the first degree" and defines in *The Economics of Welfare* (4th ed., 1932), p. 279, as "the charge of a different price against all the different units of a commodity, in such wise that the price exacted for each was equal to the demand price for it, and no consumers' surplus was left to the buyers."

[8] This assumption shows clearly that our problem has nothing to do with the "location" problem of Alfred Weber, which is concerned with finding the location where costs of production (including transportation costs of both raw materials and finished products) are minimized, and where the consumers are all located at one point.

[9] Chamberlin, in *The Theory of Monopolistic Competition* (1933), seems to accept this argument of Hotelling's, which he calls "a conclusion of great importance" (p.

Since Hotelling is concerned to derive some practical conclusions from his argument as to the relative efficiency of capitalism and socialism, the fifth assumption reads rather strangely. For, if interpreted literally, it is only possible for each buyer to purchase one unit, irrespective of price, if there is no upper limit to his expenditure. In such a case the location of a single seller is indeterterminate, for in any location a unit can be sold at an infinite price. It is necessary, therefore, to assume an upper limit to the price each buyer is willing to pay for his unit of the commodity if we are going to be at all realistic. We shall find later that the value of this limit is of primary importance for the problem of determining the location, price, and output of the producers.

III

We can now proceed to the analysis of the problem. The result will be found to rest upon the relationship between three quantities: (*a*) the length of the market; (*b*) the cost of transport; (*c*) the price buyers are willing to pay for the delivered commodity, i.e., price plus transport cost. For the sake of simplicity we shall assume, in the first place, that the upper limit to each consumer's absolutely inelastic demand is the same. This limit we shall call the "demand price." By taking the demand price and the length of the market as unity, we can express this relationship in terms of c, the cost of transport. Thus, if the cost of transporting one unit of the commodity across the whole length of the market is equal to the demand price, c will be equal to 1. Transport costs can also be expressed in terms of the distance (measured as a fraction of the length of the market) over which a unit of the commodity can be transported for unit cost (which is the demand price). Let d be this distance. Then $d = \frac{1}{c}$. An increase in the

195) though he has some reservations to make in the case of more than two sellers. Professor F. Zeuthen, in his *Problems of Monopoly and Economic Warfare* (1930), reports "interesting remarks" without comment (p. 40). Cf. his article, "Theoretical Remarks on Price Policy: Hotelling's Case with Variations," in *Quarterly Journal of Economics*, February, 1933, p. 231. The article of Dr. E. Schneider on "Bemerkungen zu einer Theorie der Raumwirtschaft" in *Econometrica*, January, 1935, p. 79, appeared when this article was in preparation.

demand price while the length of the market and the cost of transport are constant will thus show itself in a proportionate diminution in c or increase in d. An increase in the cost of transport per unit product per unit distance will, of course, be shown directly by an increase in c or diminution in d. A lengthening of the market, the other two values remaining the same, will show itself in a proportionate increase of c or diminution in d. In our diagrammatical treatment we shall show variations in c by such variations in the length of the market.

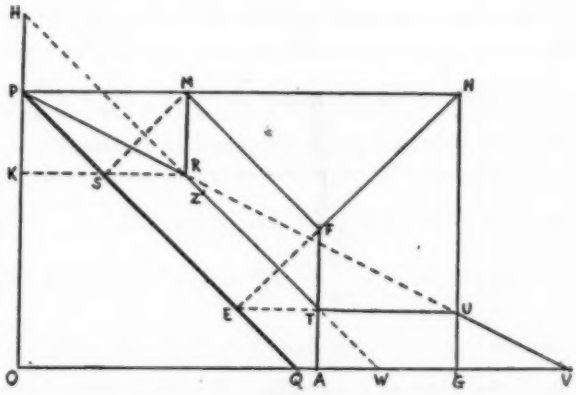

FIG. 1

If c is greater than 1, a producer will supply customers over a distance d and charge a price of $\frac{1}{2}$, since this gives him a maximum revenue of $\frac{d}{2}$ (which is the greatest possible revenue under any circumstances). This is illustrated graphically in Figure 1. OG is the length of the market. OP is the demand price. The slope of FN or FM or PQ (which are all equally inclined to the horizontal axis) represents the rate of rise of cost to consumers as a result of the incurrence of transport costs, as they move away from a source of supply, so that the slope of the lines, $\left(\frac{OP}{OQ}\right)$, equals C, the cost of transport.

Then the location of any producer, his price, the number of customers he supplies, and the cost to each of them can be shown by a figure like *MNFA* in Figure 1 resembling the letter Y. *F* shows the "position" of the source, by which we mean the location and the price he charges, the abscissa measuring the location in terms of distance from *OP*, and the ordinate measuring the price charged; *MN* is the length of market supplied;[10] and any point on *FM* or *FN* indicates the position of a customer, the abscissa measuring his location and the ordinate measuring the cost to him. The producer wishes to maximize his profit, which is equal to *AF* (his price) multiplied by *MN* (quantity sold). This is maximized when $AF = \frac{1}{2}$. His demand curve can be represented by *PV*, which will be a straight line with a slope of $\frac{c}{2}$, since a reduction in price will increase the length of the market that he supplies *on either side* by a distance over which the transport cost is equal to the reduction in price. His output will be $\frac{OV}{2} = OQ = MN = d$; his price will be $\frac{OP}{2} = AF = \frac{1}{2}$; and his profit will be $\frac{d}{2}$.

He can do this anywhere as long as he keeps a distance $\frac{MN}{2}$ away from the edges of the market. This makes his position indeterminate over a range equal to $PN - MN$ or PM, which is equal to $1 - d$, because positions within this range are indifferent to him.[11]

If $c = 1$, d, its inverse, also $= 1$ and MN, which $= d$, coincides with PN, so that the range of indeterminacy PM disappears. The position of the producer is determinate at the center of the market, and the whole market is supplied.

[10] By this same measure are indicated: (*a*) distance, (*b*) number of customers supplied, and (*c*) quantity of commodity sold.

[11] Strictly speaking, his demand curve is only a straight line throughout its length if $c > 2$. If $c < 2$, part of the demand curve will fall outside the market, as does the section of it *UV* in Figure 1, so that the lower end must be considered as being cut off vertically, giving a demand curve *PUG*; but as long as $c > 1$, less than half of it is so cut off, so that the point of unit elasticity or maximum revenue is unaffected.

If $c<1$, the position remains determinate in the center of the market; but the price will be raised, since this can be done without losing customers. The letter Y is just fitted into the market, the arms *FM* and *FN* being shortened and the stem *AF* lengthened. *AF*, the price charged, will be equal to *OP* minus the cost of transporting a unit across half the market, or $1-\frac{c}{2}$. Thus, if $c>1$, price $=\frac{1}{2}$; if $c<1$, price $=1-\frac{c}{2}$. If $c=0$, price $=1$, which is the case of a perfect market. Similarly, if there is only one customer located at the source, there are no transport costs and the price $=1$.

IV

We can now consider the case of two producers, A, the first in the field, being located at the extreme right of his indifference range (if any), while B keeps to the left of any indifference range he may have. B will always keep to the left of A as long as $c>1$. We will assume that B expects A to keep the same position (location and place). This is not Hotelling's assumption. He assumes that, in choosing his location, B considers that A's price will be that which is reached after a long process of price changes that follow from each producer adjusting himself each time the other changes his price, each producer choosing his own price each time on the assumption that the other's price is fixed. This means that, in choosing the location of his plant, B acts with greater wisdom than in fixing his price, and that once the location is fixed the greater wisdom evaporates. If B is no wiser in the one case than in the other (which is our assumption), he will take both A's location and his price as fixed in choosing his own location and price.

B's position will always be as indicated by the co-ordinates of some point on *PQ*. Any point to the left of *PQ* cannot indicate a position chosen by B, since by moving to the right toward *PQ* he will be able to increase his sales at the same price. If his moving to the right does not encroach on A's customers, his sales will increase by the distance he moves.[12] If he is encroaching on A's

[12] See above, n. 10, where it is indicated that the measure serves for distance, sales, and number of customers.

customers, his gain will be only half of this, on account of a *double* resistance to his expansion. On the one hand, there are his own increased transport costs; and on the other hand, there is the reduction in the transport cost incurred by A's customers as those nearer to A are approached. In either case, B gains by moving toward PQ.

Similarly, no point to the right of PQ will be chosen by B. If B does not encroach on A's customers, he will be indifferent as between positions on PQ or to the right of it; but we have assumed that he keeps to the left of his indifference range. If he is encroaching on A's customers, a movement to the left toward PQ, keeping his price constant, will not change the sales to customers on his left, while it increases the sales on his right[13] by half the distance he moves.

It may perhaps be useful to warn the reader that PQ is *not* a demand curve but a "location" curve, relating price not to sales but to location.

The *demand* curve, however (allowing the entrepreneur to adjust his position to the price according to the location curve), will be as shown by $PRTUV$. The slope of PR is $\frac{c}{2}$ because a reduction in price will increase sales *on either side*. Thus if we consider price continuously reduced from OP to OK, the position will move along PQ from P to S, while the sales will increase, as shown by the increasing abscissa of PR as we move along it from P to R, reaching $KR = PM$. At this point, price will be OK, location will be KS, and sales will be $PM = 2KS$. At this point he begins to encroach on A's customers.

The slope of RT, the second section in the demand curve, will be c. Consider the consumer who is located to the right of producer B at a distance from him equal to SR. When B is located at S, this consumer will be at M. To him the cost will be the same whether he buys from A or from B. We may call him the "marginal" customer. As B moves down SQ, the cost of B's product

[13] The new customers will, of course, be to the *left* of the old customers; but since B has moved to the left, some of the customers that were previously on his left are now on his right.

to the customer (now a different one), who is at a distance equal to SR to his right, is reduced by the amount by which B reduces his price, since the transport costs are unchanged. But this customer will now be nearer to A by this distance, so that the cost to him of A's product will be reduced by the same amount. This means that the "marginal" customer is a constant distance (SR) to the right of B or that B's sales to customers on his right are unchanged by his movement down PQ. The increase in sales to customers on his left (which now comprises the whole increase of his sales) as he moves down PQ is equal to the increase in his distance from OP, so that the demand curve and the location curve have the same slope, namely, c. RT is parallel to PQ.

TU, the third section of the demand curve, will be horizontal because, when B's sales have grown to OA (at a price AT, his location being shown by E), the smallest movement down PQ will, at one blow, capture all the customers on A's right. B's sales will expand to OG, and he will be supplying the whole market.[14]

We are now in a position to consider what determines the position of B. Wishing to maximize his revenue, he will choose the point on the demand curve where the elasticity is equal to unity. If c is very large, B will be unaffected by the existence of A (who is not really a competitor). His demand curve will be a straight line, of the form of PV, having a slope of $\frac{c}{2}$ and situated entirely to the left of M. There will be no depression of the form of RTU in his demand curve because, even if he reduces his price to zero, he will not encroach on A's customers. The point of unit elasticity on his demand curve will be directly above Q, where the location curve (which may also be considered as a marginal revenue curve) cuts the x-axis. This will give a price of $\frac{1}{2}$, a location of $\frac{d}{2}$, ($OQ = d$) and sales equal to d. The position of B will, in every

[14] UV is the continuation of the curve if producer A is not at the extreme right of his indifference range. Its slope is $\frac{c}{2}$ again, it being the direct continuation of PR. The straight line PV gives the shape of the demand curve for a single seller. The depression RTU shows the effect of the existence of a competitor.

respect, be the same as that of A except that he is at the other end of the market. There are two letters Y, with an indifference range between them.

As c diminishes, the indifference range contracts until c falls to 2, when the indifference range disappears. Each seller will supply d, which is half of the market, and will be located at a quartile of the market. The point on the demand curve of unit elasticity will be R, PR being equal to RV (R will lie directly above Q).

Where $c<2$, A being located at $1-\frac{d}{2}$ and supplying more than half the market, B will have the choice of placing himself on the point of maximum revenue on his location curve or cutting A out by locating himself as near as possible to A and charging a price slightly lower than A's (which is $\frac{1}{2}$). The profit of undercutting will be greater than the other maximum since it will be (nearly) equal to the profit obtained by A in B's absence, so that B will cut A out whenever $c<2$.

Thus we see that on the assumption that B takes A's *position* as given (i.e., location *and* price), he will in no case behave in the way that follows from Hotelling's hypothesis. He will not go as near as possible to A, "trying to get between him and a mass of customers," but will either keep at a distance of not less than d from him or will cut him out. Our assumptions as to what positions are chosen when there is an indifference range, while simplifying the treatment, do not affect this result.

V

We can now consider the further repercussions when the producers react to each other, retaining our assumption that each takes the position of the other as given every time it changes.[15] We shall consider below what happens when experience teaches them to revise this assumption.

A will respond in the way described above for B, and for the same reasons. If the reductions in price in undercutting are infinitesimal, the position remains the same, A and B alternately changing places. If it is necessary to undercut by a finite amount,

[15] On the assumption that there are no costs of changing location.

the price will continually fall. The location will remain the same $\left(1 - \frac{d}{2}\right)$ since any movement away from AF will have to be accompanied by an additional reduction in price of c times the distance moved if the customers on the other side of AF are not to be lost. This implies a movement farther down the location curve, and this will not be profitable since price is already less than $\frac{1}{2}$. Location will therefore remain the same and price will fall until profits are no greater than what can be obtained by moving to the most profitable point on the location curve (at the other end of the market). When this state of affairs has been reached, one of the sellers, instead of undercutting, will go to this position. The opportunities for the other are thereby changed; but after a number of movements, the nature of which depends upon the value of c, the same cycle of events repeats itself, so that no equilibrium is reached as long as each seller takes the position of the other as given and c is less than 2.

Let B be the seller who first finds it profitable to stop undercutting and goes to the location curve on the left of the market.

For values of c between 2 and $\frac{17 + \sqrt{17}}{12}$ (which is about 1.76),[16] B will find that he can make as large a profit by moving to

[16] The value of c for this critical point is found as follows: When B withdraws he supplies $\frac{3}{4}d$ of the market and charges a price equal to the demand price minus the cost of transport over half the market he supplies. This is

$$1 - \frac{\frac{3}{4}d}{2}c = \frac{3}{4}.$$

His profits are therefore $\frac{3}{4}d$. The output, when undercutting, is $1 - \frac{3}{4}d$; and the price is less than $\frac{1}{2}$ by just sufficient to extend sales to within $\frac{3}{4}d$ from the farther edge of the market. That is, the price is less than $\frac{1}{2}$ by the cost of transport over a distance equal to the difference between the length of the market minus $\frac{3}{4}d$ and the supply at price $\frac{1}{2}$, which is d. That is, price equals

$$\tfrac{1}{2} - (1 - \tfrac{3}{4}d - d)c$$

and profits equal

$$(1 - \tfrac{3}{4}d)[\tfrac{1}{2} - (1 - \tfrac{3}{4}d - d)c].$$

By equating this to $\frac{3}{4}d$, we obtain

$$c = \frac{17 + \sqrt{17}}{12} = 1.76.$$

his location curve instead of cutting A out while the unsatisfied market is greater than $\frac{3}{4}d$, so that he maximizes his profit without encroaching on A's sales.[17] A will then raise his price to $\frac{1}{2}$ again in order to maximize his profit, which will then be equal to $\frac{1}{2}d$ and greater than what B can make without undercutting A. B will then undercut A, and the cycle repeats itself.

When $c < \frac{17 + \sqrt{17}}{12}$, B finds less than $\frac{3}{4}d$ unsupplied and encroaches on A's sales, staying on the location curve PQ and charging a price gradually falling below $\frac{3}{4}$ as c diminishes. A now finds that his profits are decreased by B's encroachment, but he can bring them back again to the maximum figure of $\frac{1}{2}d$ by raising his price to $\frac{1}{2}$ as long as B's position is such as would leave unsupplied a range equal to d at the right of the market. In this case, A raises his price to $\frac{1}{2}$ and B cuts him out again, repeating the cycle in the same way as when B did not encroach on A but withdrew to the unsatisfied portion of the market. When c falls beyond a certain value,[18] however,

$$1 + \frac{23 + \sqrt{11}}{37} = 1.703\ ,$$

it will not be possible for A to get back his old profit by restoring the old price of $\frac{1}{2}$, for he will find some of the market encroached

[17] B will find it profitable to encroach on A's sales, or to restrict himself to the unsatisfied market according as the latter is $\lesssim \frac{3}{4}d$. See p. 162 below.

[18] B will begin to encroach on A's initial market (d) when his location is $\frac{1-d}{2}$. Since he is on his location curve, his price will be

$$1 - \frac{1-d}{2}c = \frac{3-c}{2}\ .$$

His output will be $\frac{3-c}{2}d$ (since the point of unit elasticity is the mid-point of a straight-line demand curve with slope c) and his profit will be $\left(\frac{3-c}{2}\right)^2 d$.

In Figure 2 KT = B's output = $\frac{3-c}{2c}$,

KS = B's location = $\frac{1-d}{2}$,

$SU = PM = 1 - d$,

$SZ = 2ST = 2(KT - KS)$.

[Footnote continued on page 157]

upon by B from the position he took up when he ceased undercutting. But he will be able to restore his old profits by going immediately beneath the corresponding point on the other side of the market, incidentally cutting B out again. Located at $\frac{d}{2}$ instead of $1 - \frac{d}{2}$, and charging just less than $\frac{1}{2}$, he will supply just over d and will make a profit just under $\frac{d}{2}$. B will be cut out, since he is on the location curve PQ and the left-hand branch of A's Y falls just below his. The cycle of movements here is slightly more complicated, the drama being carried out alternately on each side of the market, the order of the positions being shown by the numbers on Figure 3. The series of arrows indicates movements which take a number of steps each of which consists of one undercutting the other at the same location.

[Footnote continued from page 156]

B's price when undercutting instead of moving away and encroaching equals

$$AF' = AF - FF' = AF - (ZU)c = AF - (SU - SZ)c$$
$$= \tfrac{1}{2} - \left[1 - d - 2\left(\frac{3-c}{2c} - \frac{1-d}{2}\right)\right]c = \tfrac{1}{2} - (3c - 5).$$

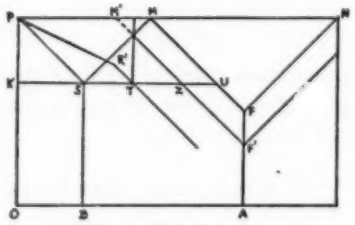

FIG. 2

B's output when undercutting is equal to D plus the increased sales (on the left) by reducing price from $\frac{1}{2}$ by

$$3c - 5 = d + \frac{3c-5}{c} = 3 - \frac{4}{c}.$$

B's profit when undercutting will therefore be $(\frac{1}{2} - 3c - 5)\left(3 - \frac{4}{c}\right)$, which we equate to $\left(\frac{3-c}{2}\right)^2 d$, the profit when encroaching. From this equation we get $c = 1 + \frac{23 + \sqrt{11}}{37} =$ about 1.703.

When $c = \frac{3+\sqrt{5}}{4}$ (about 1.31), the price charged by the undercutting producer at the moment when it pays the other to abandon undercutting and go to the best point on his location curve is such that the left branch of his Y goes through P (Fig. 1) and the price is just low enough to supply the whole market. The left-hand branch of A's Y, the section of B's demand curve RT, the location curve PQ, and the left-hand branch of B's Y all coincide, the parallelogram $PRMH$ of Figure 1 converges to one point at P, and the price charged by B is $\frac{1}{2}$ while his location is $\frac{d}{2}$.

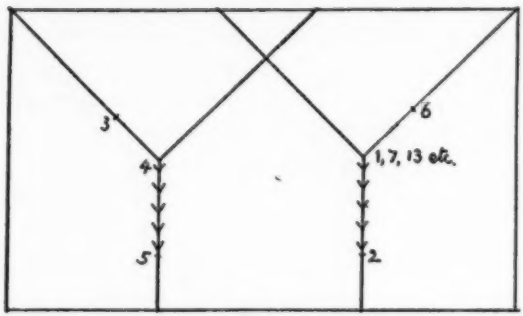

FIG. 3

The gap between positions 3 and 4 (and similarly that between positions 6 and 7) in Figure 3 disappears, so that there are only four points to mark in the cycle here.[19]

When $c < \frac{3+\sqrt{5}}{4}$, B retires only when the price is lower than necessary to supply the whole market, and goes to a position not on his location curve (for that would be undercut by the present position of A) but on a branch of A's Y which is now his demand curve. The series of movements will now be much more complicated, as undercutting takes place not at the same location each time $\left(\text{such as } \frac{d}{2} \text{ and } 1 - \frac{d}{2} \text{ in the cases above}\right)$ but wherever B

[19] In Fig. 4 let c be that value at which the whole market is supplied when B abandons undercutting and goes from F' to S. Then the profits at F' are equal

finds it profitable to go to when abandoning undercutting; and there will be an infinite series of movements converging to a route like 1, 2, 3, 4, 1, etc., in Figure 4. The field of movements will be shown by the area $KLJW$ in Figure 5, where OK and GK have slope c and LJ and JW are sections of the curves for the equations

$$y = \left[\frac{x+y}{2}\right]^2 \quad \text{and} \quad \left[\frac{(1-x)+y}{2}\right]^2.$$

Since $OA = 1 - \frac{d}{2}$, the undercutting activity in the first place will bring the price down to that shown by F'. From F', B will move to S along PQ, which is A's Y and B's demand curve. The equation of the curve tells us that the area of the rectangle OS = profits at F'. At S, undercutting brings the price down again until the curve is reached, and then there is a move toward the other side of the market similar to the move $F' - S$. This goes on forever, and no final equilibrium position is reached.

When $c \gtrless 1$, A locates himself at the middle of the market, so that the position is shown as falling down through K until it reaches J. There will then be movement to a side of the market along a line like $F'S$ having slope c. It will be indifferent to which side of the market the first move of this kind is made; but after this the series of movements goes on as before, and no position of final equilibrium is ever reached.

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to the profits at S. $FF' = (PM)c$, and $PM = 1 - d$, so that profits at F' are

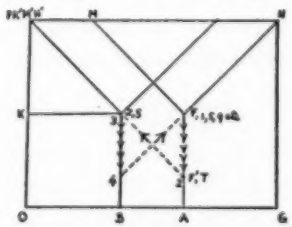

FIG. 4

$1 \times [\frac{1}{2} - (1-d)c]$. Profit at $S = OK \times OB = \frac{1}{2} \times \frac{d}{2} = \frac{d}{4}$. From the equation of these profits we get $c = \frac{3+\sqrt{5}}{4}$ = about 1.31.

Strictly, the whole of the area *KLJW* will be available for these movements only when $c<1$. For otherwise there might be some free market left, so that the competitor's Y will not coincide with the demand curve. Thus in Figure 5, where $c>1$, the parts of *KLJW* in dotted line are not applicable. The section *KF* is inapplicable because it is not part of B's demand curve, for that is halfway between *KF* and *SF'*. The section *WF'* is inapplicable because in this range A will not be supplying the whole market,

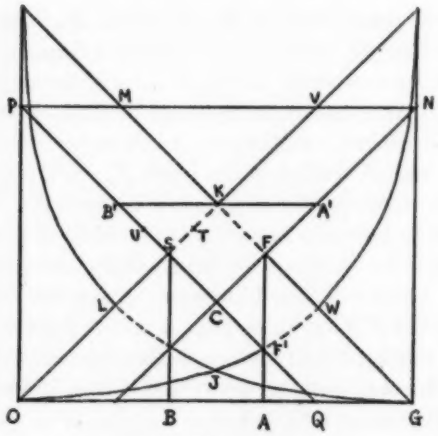

FIG. 5

so that his profits cannot be indicated by price (multiplied by 1) but by price multiplied by sales which are less than 1. By symmetry the same applies to the other side. When $c = \frac{3+\sqrt{5}}{4}$, or 1.31, *F* will lie vertically above *F'*, giving us the four-cornered route; and these two points will be the only points (on the right) which remain valid of the whole figure *KLJW*. When $c<1.31$, *F* is to the left of *F'*, leaving a range of *KLJW* valid. When $c = 1$, *PQ* coincides with *KW;* and the invalidated ranges disappear. If the slope *c* is drawn at 45°, as in our figures, the four-cornered route to which the movements converge must form a

square. This enables us to determine the locations to which the movements converge.

$$FF' = SF = 2(x - \tfrac{1}{2}), \qquad (x = OA)$$
$$FF' = AF - AF' = AG - y = 1 - x - y.$$

From this equation

$$2(x - \tfrac{1}{2}) = 1 - x - y$$

and the equation

$$y = \left(\frac{x + y}{2}\right)^2,$$

we get

$$x = \frac{\sqrt{5} - 1}{2} \text{ (or about } \tfrac{5}{8}).$$

By symmetry the other location is $\frac{3 - \sqrt{5}}{2}$, or about $\frac{3}{8}$.

VI

So far we have been working on the assumption that each seller considers the other's position (price and location) as fixed. Every time his competitor changed his position, he considered the new position as final. We may now consider what happens when he loses this faith.

We will suppose that each seller assumes that his competitor will not respond to an encroachment on his customers, even when the encroachment deprives him of nearly half his customers; but that he will react to the loss of the whole of his trade when undercut, and that this reaction will take the form of moving to the position most profitable on the assumption that the undercutter's position is fixed. B will now not undercut as soon as c is less than 2, but will choose the point of unit elasticity on his demand curve, as shown in Figure 1. The demand curve will come to an abrupt stop at T, where, instead of finding it suddenly very profitable to lower his price so as to cut A out, he finds it most unprofitable, for that would dislodge A, who would undercut him and reduce his gains to zero.

As c diminishes from 2 downward, the point of unit elasticity will remain at R (Fig. 1) because of the discontinuity of the demand curve at that point. When $c = 2$ and $PR = RV$, HR is greater than RW. As c diminishes, R rises; and HR diminishes relatively to RW. It is not until HR becomes less than RW that the point of unit elasticity leaves R and moves down the second section of the demand curve. This does not happen until c falls to $\frac{5}{3}$.[20] In this range of c between 2 and $\frac{5}{3}$, while the point of unit elasticity remains at R, the whole market is supplied, but B does not encroach on A's customers. He restricts himself to the unsatisfied customers on the left of the market, locates himself at the center of the unsatisfied range, and charges a price which rises from $\frac{1}{2}$ when $c = 2$ to $\frac{2}{3}$ when $c = \frac{5}{3}$, while his sales fall from d to $\frac{2}{3}d$. This gives a position of final equilibrium.

As c falls below $\frac{5}{3}$, the point of unit elasticity moves down RT, the second section of the demand curve, and B begins to encroach on A's customers. He moves closer and closer to A, reducing his price and increasing his sales until c falls to 1. The point of unit elasticity, Z in Figure 1, which is the mid-point of HW which lies halfway between PQ and MF, moves downward and nearer to F, coinciding with F when $c = 1$, when PQ, HW, and MF coincide, R, M, and H coincide with P, and Z and T coincide with F. On these assumptions, then, Hotelling's assertion that sellers will cluster together is only true for values of $c \gtrless 1$, that

[20] It is sufficient for this result to prove that when $HR = RW$, $c = \frac{1}{2}$.

$$OK = KH \because WR = RH,$$

$$KP = \frac{KH}{2} \because \text{slope } HR = \text{twice slope } PR,$$

$$\therefore KP = \frac{OK}{2} = \frac{OP}{3}.$$

$$KS = \frac{OQ}{3} \text{ (by similar triangles } PKS \text{ and } POQ) = \frac{MN}{3},$$

$$KS = \frac{PM}{2},$$

$$\therefore MN = d = \tfrac{1}{2}PM = \tfrac{1}{2}PN = \tfrac{1}{2}.$$

$$c = \frac{1}{d} = \frac{1}{\frac{1}{2}}.$$

is to say, only where the cost of transporting a unit of commodity across the whole length of the market is less than the price

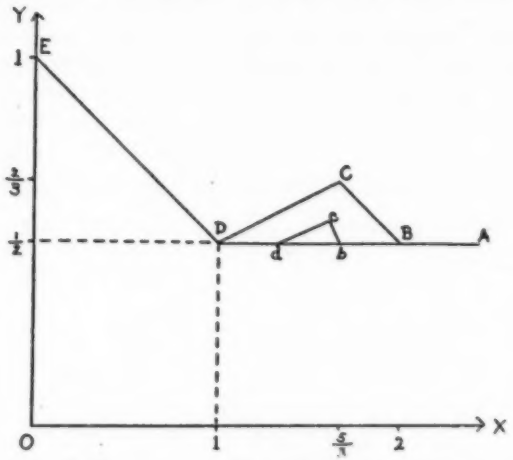

FIG. 6.—Along *OX* is measured c, and along *OY* the price charged. *EDA* gives the price charged by A, and *EDCBA* gives that charged by B. The elevation *DCB* corresponds to the depression *RTU* in B's demand curve in Figure 1, when he restricts himself to smaller sales at a higher price because of A's competition.

CHART I*

c	d	A				B		
		Location	Price	Output I	Output II	Location	Price	Output
∞ to 2	0 to $\frac{1}{3}$	$1-\frac{d}{2}$	$\frac{1}{2}$	d	d	$\frac{d}{2}\to 1-\frac{3d}{2}$	$\frac{1}{2}$	d
2 to $\frac{4}{3}$	$\frac{1}{3}$ to $\frac{2}{3}$	$1-\frac{d}{2}$	$\frac{1}{2}$	d	d	$\frac{1-d}{2}$	$\frac{3-c}{2}$	$1-d$
$\frac{4}{3}$ to 1	$\frac{2}{3}$ to 1	$1-\frac{d}{2}$	$\frac{1}{2}$	d	$\frac{3-d}{4}$	$\frac{3d-1}{4}$	$\frac{1+c}{4}$	$\frac{1+d}{4}$
1 to 0	1 to ∞	$\frac{1}{2}$	$1-\frac{c}{2}$	1	$\frac{1}{2}$	$\frac{1}{2}$	$1-\frac{c}{2}$	$\frac{1}{2}$

* Output I: A's output in B's absence; Output II: A's unadjusted output in B's presence. A is at the right edge of his indifference range in B's absence; B assumes that A will maintain his position if encroached upon but will retaliate if undercut.

each consumer is willing to pay for it. Our results are shown in Figure 6 and Chart I.

If c is very large, the indifference range becomes very significant, and it is possible that the producers will be located very near to each other in the same part of the market. This may look like Hotelling's "clustering together," but it is quite a different kind of thing. There is here no question of one producer getting between the other and a mass of customers, for the producers do not compete with each other at all; nor is this arrangement socially more undesirable than any other location, the only effect of different locations being to leave different parts of the market unsupplied.

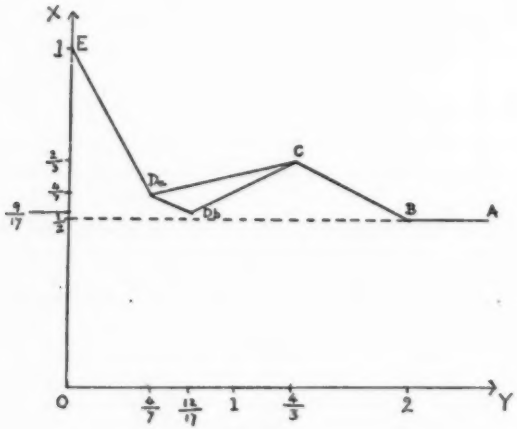

FIG. 7

VII

In the case specifically mentioned by Hotelling, the results are not significantly different. Figure 7 and Chart II show the results if A, instead of choosing the most profitable position and keeping to the right of any indifference range, is considered to be fixed at a quartile of the market (say the right quartile). For values of $c>6$, there is an indifference range for B on either side of A, so that he may choose a location fairly near to A and on his right, both being located in the right quarter of the market. This, of course, is no more a case of "clustering together" in Hotelling's

sense than the case mentioned above (p. 164). Not only does B keep a distance not less than d from A, but he does not necessarily try to get between A and the center.

An interesting result is brought out by Figures 6 and 7 in their peaks and depressions. These signify that at the peaks price

CHART II*

c	d	A				B		
		Location	Price	Output I	Output II	Location	Price	Output
∞ to 6	0 to $\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	d	d	a) $\frac{d}{2} \to \frac{1}{4} - d$	$\frac{1}{2}$	d
						b) $\frac{1}{4} + d \to 1 - \frac{d}{2}$		
6 to 2	$\frac{1}{4}$ to $\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$	d	d	$\frac{d}{2} \to \frac{1}{4} - d$	$\frac{1}{2}$	d
2 to $\frac{1}{2}$	$\frac{1}{2}$ to $\frac{3}{4}$	$\frac{1}{4}$	$1 - \frac{c}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$1 - \frac{c}{4}$	$\frac{1}{2}$
$\frac{1}{2}$ to $\frac{15}{32}$	$\frac{3}{4}$ to $\frac{17}{32}$	$\frac{1}{4}$	$\frac{1}{2} + \frac{c}{8}$	$\frac{d}{2} + \frac{1}{8}$	$\frac{15}{32} - \frac{3d}{8}$	$\frac{5d}{8} - \frac{7}{32}$	$\frac{1}{2} + \frac{7c}{32}$	$\frac{3d}{8} + \frac{7}{32}$
$\frac{15}{32}$ to $\frac{1}{4}$	$\frac{17}{32}$ to $\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2} + \frac{c}{8}$	$\frac{d}{2} + \frac{1}{8}$	$\frac{1}{4}$	$\frac{d}{4} + \frac{5}{128}$	$\frac{1}{2} - \frac{5c}{16}$	$\frac{1}{4}$
$\frac{1}{4}$ to 0	$\frac{1}{2}$ to ∞	$\frac{1}{4}$	$1 - \frac{3c}{4}$	1	$\frac{1}{4}$	$\frac{1}{4}$	$1 - \frac{3c}{4}$	$\frac{1}{4}$

* Output I: B absent; Output II: B present.
A is located at the right quartile. B expects that A will not react if encroached upon but will retaliate if cut out. In the first three cases ($c = \infty \to \frac{1}{4}$) this gives final equilibrium immediately if A has the same expectations. If B's expectations are correct, all cases give final equilibrium.

will be lowered and at the depressions price will be raised by any change in transport costs, independently of whether the change is an increase or a decrease. Such peaks are C in the case of B in Figure 6, and for both A and B in Figure 7. Such depressions are D in the case of B in Figure 6; and in Figure 7, D_a for A and D_b for B. This may be of interest for the pure theory of transport. Naturally, its applicability by the Ministry of Transport is completely negligible.

Figure 8 enables us to see how A will adjust his price and output

to the value of c. In this diagram we show variations in c not by varying the length of the market in our drawings but by varying the demand price. The demand price varies inversely with c (see p. 149) and can therefore be equated to d by appropriate choice of units. OG is the length of the market, which is divided into four quarters by the perpendicular lines which show the median M and the two quartiles Q_1 and Q_2. Demand price (and d) is measured *downward* along OY'. The point on OY' corresponding to any value of d must be considered as indicating the *base line* of a figure like Figure 1. A will be located on Q_2Q_2'. His demand curve will be shown by the section of $GABY'$ cut off by the base line (measuring quantity by the distance from GG'). From this we can derive the marginal revenue curve $GCDEY'$. From the average marginal relationship it follows that $DC = CA = AM = GH$. A's output is shown by the intersection of the marginal revenue curve with the base line, and his price by the vertical distance from the base line of the corresponding point of the demand curve. Thus output is d and price is $\frac{\beta}{d}$. From this figure all the values for A's output and price can be read off, and the formulas given for these in Chart II can be derived.

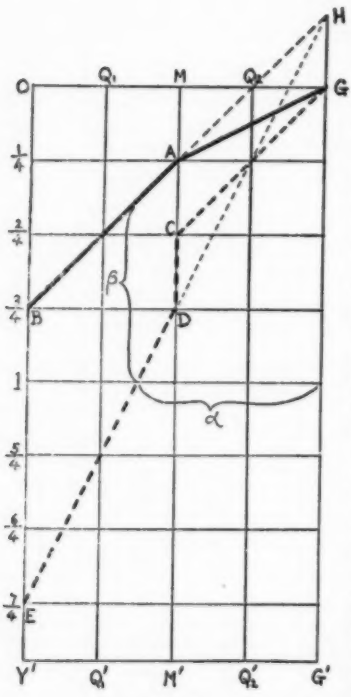

FIG. 8

B's location, price, and output are not so easily obtained. The indifference ranges in the first two lines of Chart II arise when c

is large and B is able to maximize his profits by selling d at half the demand price and can do this over a range of different locations. For values of d between $\frac{1}{2}$ and $\frac{3}{4}$, B finds that A is supplying exactly half the market. His own demand curve, which is of the form of the demand curve in Figure 1, has the discontinuity R in the center of the market, so that it is exactly symmetrical with A's demand curve $GABY'$. Over this range, the point of maximum revenue remains at the corner R, and B finds it most profitable to locate himself at the other quartile and to charge the same price as A. Here we again have final equilibrium. As d increases beyond $\frac{3}{4}$ (c becomes less than $\frac{1}{4}$) the point of unit elasticity for A begins to move down AB (Fig. 8), and A finds it profitable to expand output gradually and supply more than half the market. B also finds that the point of unit elasticity moves down the second section of his demand curve (RT in Fig. 1), reaching T when $c = \frac{1}{14}$.[21] At T, the demand curve becomes perpendicular, and so B stays at that point on it. When $c = \frac{1}{14}$, B's location is $\frac{2}{3}$; and as c diminishes, B moves nearer and nearer to A, reaching A's location ($\frac{3}{4}$) when $c = \frac{1}{4}$. At this value of c, A supplies the whole market (before B arrives), so that the left arm of his Y coincides with B's demand curve (which is halfway between the Y and the location curve) and T coincides with F. B will be located as near A as possible on his left, charge the same price, and supply $\frac{3}{4}$ of the market, leaving $\frac{1}{4}$ to A. Thus we have Hotelling's case only when $c < \frac{1}{4}$.

VIII

We have so far considered only B's adjustment to A's initial position. If A's position is fixed, this will give final equilibrium, the details of which are shown in Charts I and II. But A may be free to change his price or location or both, and he may be induced to change these by B's presence.

Let us consider first the case where the locations are fixed at

[21] From the formula for B's output, $\frac{3d}{8} + \frac{7}{24}$, given in Chart II for $c < \frac{1}{4}$, we find that B supplies $\frac{1}{4}$ of the market as soon as $c = \frac{1}{14}$. He will therefore not continue to expand his sales as c diminishes, since he cannot supply more than $\frac{1}{4}$ of the market without cutting A out.

the point first chosen but where prices are free to vary. If each assumes the other's price, as well as location, fixed, he will at first react in the way described above (p. 154). For all values of $c<2$, B will undercut A. A will react by undercutting in turn until price falls to zero.

A more useful assumption is that each assumes that the other will not react if encroached upon but will retaliate if cut out. B will then not undercut A but will choose the position which gives the greatest profit without cutting A out. Supposing A to be located at what was the right edge of his indifference range in B's absence, namely, $1 - \frac{d}{2}$, if $c < 2$, A's sales are reduced in the first place from d to $\frac{3 - d}{4}$, (see Chart I), so that they fall by $\frac{d - [(3 - d)/4]}{d}$ of their previous amount. This proportional encroachment of B on A's sales we shall call k. The term kd will then stand for the quantity of sales lost to B, or the length of market transferred to him. The value of k can be expressed in terms of c, since it is equal to half the excess of the separate sales of the producers each taken in the other's absence over the size of the market. Thus

$$kd = \frac{d + \frac{3d - 1}{2} - 1}{2} = \frac{5d - 3}{4}$$

and

$$k = \frac{5 - 3c}{4}.$$[22]

R is $2kd$ to the right of M (Fig. 9). A's sales will therefore be affected for any price at which he would, in B's absence, supply customers to the left of R. But any price which would not supply the $2kd$ customers between M and R will also fail to supply the

[22] The same value is obtained by observing the diminution in A's sales when B competes with him. This is $d - \frac{3 - d}{4}$ as given in Chart I, and $= kd$. Divided by d, this gives the foregoing value for k.

same number of customers to the left of N, and will therefore supply not more than NT or $d - 4kd$ ($MT = 4kd$). We can now consider A's demand curve $NABC$ measuring quantities from right to left. NA will have a slope of $\frac{c}{2}$. A is $d - 4kd$ to the left of NG, and $\frac{c}{2}(d - 4kd) = \frac{1}{2} - 2k$ below PN. AB will be steeper since a reduction in price, while bringing the same increase in sales on the right, will now only bring in half the increase on the

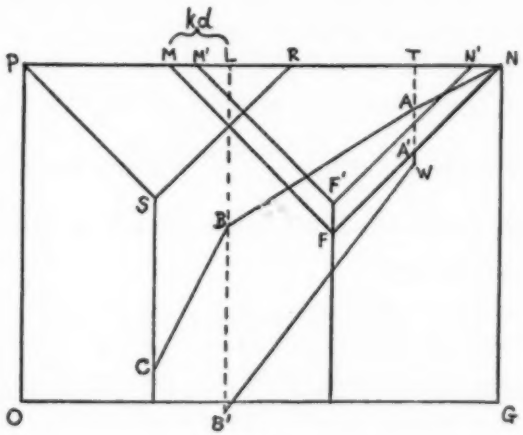

FIG. 9

left because of the double transport costs (A's and B's) to be overcome. The slope will therefore be $\frac{1}{4}$ times as great, or $\frac{3}{4}c$. The point B will be directly beneath L (which is $d - kd$ to the left of NG, or kd to the right of M), and its ordinate will be $\frac{1}{2}$, since this corresponds to A's initial position before reacting when B entered the market and encroached on his sales to the extent of kd. BC will have a slope of $2c$ since a further reduction in price cannot sell any more on the right, as the end of the market has been reached; while on the left, the double resistance continues. C is the point where a further reduction in price will cut out B. It will lie below S (B's position), since the customers on B's

right will already have been won over by A. The ordinate of C will be less than that of B by $2c$ times its distance to the left of BL. Its distance from BL is equal to B's location minus $kd\left[\left(\frac{PR}{2}\right) - LR\right]$. The ordinate of C is therefore

$$\tfrac{1}{2} - \left(\frac{3d-1}{4} - kd\right)2c = 1\tfrac{1}{2} - c\,.$$

Below C the demand curve is perpendicular (or comes to an end) since cutting B out will invite retaliation. The corresponding marginal revenue curve is shown in Figure 9 by $NA'WB'$. NA' has slope c or twice that of NA. $A'T = 2AT = 1 - 4k$. The ordinate of A' is therefore $4k$. $A'W = \frac{A'T}{6}$ or $\frac{1-4k}{6}$.[23] The ordinate of W will be $1 - WT$ or $\frac{28k-1}{6}$. WB' will have a slope of $\frac{4c}{3}$, or twice that of AB. B' will be lower than W by LT times $\frac{4c}{3}$, so that its ordinate is

$$\frac{28k-1}{6} - 3kd\,\frac{4c}{3} = \tfrac{2}{3} - \frac{c}{2}\,,$$

while its distance from NG is $d - kd$. At B' the marginal revenue curve jumps down by twice BB' and so gets quite out of our sight before moving any farther to the left.[24]

A's output will be shown by the intersection of the marginal revenue curve with the base line OG, and his price by the ordinate of the demand curve above the intersection (as in Fig. 8). W will fall below the base line if $k < \frac{1}{28}$. c will then be $> \frac{24}{21}$ (about 1.62). At this value of c, W will be on the base line. A's output will therefore be equal to $d - 4kd$ for all values of c between $\frac{2}{3}$ and $\frac{24}{21}$.

[23] This is because the distance between the marginal revenue curve and its demand curve increases in the same proportion as the increase of the slope of the demand curve.

[24] The position to which the marginal revenue curve jumps is $\frac{2-3c}{2}$. This makes it fall below the base line for all values of $c > \frac{1}{3}$, but this analysis applies only to values of $c > 1$.

This means that A will withdraw from all competition with B, so that the marginal customer between A and B has to pay the full demand price. A's sales diminish by four times B's initial encroachment on his sales, and his price $= \frac{1}{2} + 2k$, rising to $\frac{4}{7}$ when $k = \frac{1}{28}$, when his sales $(d - 4kd)$ are $\frac{4}{7}d$. This value is obtained by equating A's loss of sales, as given in Chart I, to $\frac{1}{28}d$. This gives us final equilibrium after A's reaction for values of c between $\frac{5}{8}$ and $\frac{34}{71}$. (For values of c above $\frac{5}{8}$, B does not encroach on A, so that there arises no disturbance of equilibrium.)

When $c < \frac{34}{71}$, $k > \frac{1}{28}$ and W lies above the base line, which is only cut by the section WB'. Then the point where the marginal revenue curve cuts the base line will be to the left of W by a distance obtained by dividing the ordinate of W by the slope of WB' $(\frac{4}{3}c)$. A's output will therefore be

$$d - 4kd + \left(\frac{28k - 1}{6}\right)\left(\frac{3}{4c}\right) = \frac{7}{8}d - \frac{1}{2}kd$$

or

$$\frac{3}{8} + \frac{d}{4}.$$

A's price, shown by the ordinate of the demand curve above the intersection of the marginal revenue curve with the base line, will be equal to the ordinate of the point A minus the extent to which the demand curve falls over a distance it takes the marginal revenue curve to reach the base line from W. Since the slope of the demand curve is half that of the marginal revenue curve, this will be equal to half the ordinate of W. The ordinate of A is $\frac{1}{2} + 2k$, so that the price is

$$\frac{1}{2} + 2k - \left(\frac{28k - 1}{6}\right)\frac{1}{2} = \frac{7}{12} - \frac{k}{3}.$$

This means that in this range, A does not withdraw from further competition with B, but lowers his price from $\frac{4}{7}$ as k increases beyond $\frac{1}{28}$, so that his sales fall only by $\frac{1}{2}$ of the increase in kd (instead of four times this), his adjustment consisting of so lowering his price (after raising it from $\frac{1}{2}$ to $\frac{4}{7}$) as to get back $\frac{1}{6}$ of the increase in the encroachment and to gain $\frac{2}{3}$ of it on his right.

B' will fall on the base line when the adjusted output $\frac{7}{8}d - \frac{1}{2}kd$ = the unadjusted output $d - kd$. From this equation we get $k = \frac{1}{4}$, and hence $c = \frac{4}{5}$. At this point A's price will have fallen back again to $\frac{1}{2}$. For values of c between $\frac{4}{5}$ and 1, the marginal revenue curve continues to cut the base line beneath L, so that A does not react to B's encroachment, and there is final equilibrium. As c diminishes from $\frac{4}{5}$ to 1, k increases from $\frac{1}{4}$ to $\frac{1}{2}$. k can never be greater than $\frac{1}{2}$ unless B decides to cut A out altogether, when it immediately jumps to 1. This is ruled out by our assumption that each fears to cut the other out lest he retaliate.[25] In the range $\frac{3}{11} > c > \frac{4}{5}$, A's first reaction to B also gives final equilibrium. In this range, A withdraws after B has chosen the most profitable position. B, now not being able to change his location, will not find it profitable to raise his price since he did not find this profitable before, even when it was possible to choose a position on his location curve, whereas now a raising of price would mean a loss of customers on the left edge of the market. He will not find it profitable to reduce his price since, coming against the left edge of the market, his demand curve has the very steep slope of $2c$.[26]

If $c < 1$, both sources will be located at the center, each supply-

[25] But if A still takes B's position as given, a point will be reached before c has fallen to 1 when he finds it profitable to reduce his price so as to cut B out altogether and supply the whole market himself. This value of c is $\frac{9 + \sqrt{113}}{16}$ = about 1.22. He will have to charge a price less than B's by the cost of transport over the distance between the two producers. These can be read off from Chart I, so that we can see that his price will be

$$\frac{1 + c}{4} - \left[\left(1 - \frac{d}{2}\right) - \left(\frac{3d - 1}{4}\right)\right]c,$$

which comes to $\frac{3}{4} - c$. By equating this price (which is also his profit, since he will supply the whole market) to $(d - kd)\frac{1}{2}$, his profit when not reacting to B's encroachment (which is the best thing he can do short of cutting B out), we get the foregoing value of c.

[26] It can be demonstrated more conclusively that B does not react to A's adjustment, by an argument similar to that used to consider A's reaction. Let $k'd$ be the corresponding encroachment of A on B's sales (the extent to which B's sales would increase if A disappeared, B keeping the same position). Then $k'd$ = twice B's location—his output after A's adjustment. This latter equals 1 minus A's output—the portion of market unsupplied near N. B's location is given in Chart I

ing half the market at a price of $1 - \frac{c}{2}$, neither attempting to undercut the other for fear of retaliation.

The course of A's prices is shown in *ABbcdDEF* in Figure 6. The abscissas of b, c, and d are $\frac{5}{7}$, $\frac{8}{11}$, and $\frac{4}{5}$. The ordinate of c is $\frac{4}{7}$.

IX

If price is fixed as originally chosen but location is not, A will not react in any way to B's encroachment as long as B does not cut him out altogether. This will be because he loses customers by moving in either direction from the location curve (see p. 151). If he were undercut by B, he would move just sufficiently to the right to regain the customers on his right. Similarly, B will never react to A's withdrawal.

If there is a fixed minimum price for all producers, this has the same effect as raising the base line of our diagram, leaving everything else unchanged. Alternatively, this can be expressed by saying that c is increased so that the market is made less perfect by the minimum price.

X

We may now consider both location and price to be adjustable, each considering that the other will not react unless cut out entirely, so that neither cuts the other out for fear of retaliation.

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as $\frac{3d-1}{4}$. A's output $= \frac{1}{2} + \frac{d}{4}$ (Fig. 9). The unsupplied market near N = (the excess of A's price over $\frac{1}{2}$) $\times\, d = \left(\frac{7}{12} - \frac{k}{3} - \frac{1}{2}\right)d$. $k'd$ thus equals

$$\frac{3d-1}{2} - \left[1 - \frac{3+2d}{8} - \left(\frac{7}{12} - \frac{k}{3} - \frac{1}{2}\right)d\right] = \frac{17d}{12} - \frac{7}{8}.$$

If we now suppose B to be situated on the *right* of Figure 9, his demand curve will be $NABC$; and his marginal revenue curve, $NA'WB'$. $k'd = ML$. $NT = NM - 4ML = \frac{3d-1}{2} - 4k'd$. $TW = (NT)\frac{7c}{6}$. $LB' = TW + (LT)\frac{4c}{3} = \frac{11}{14}$. This means that B' lies above the base line, having an ordinate of $\frac{7}{12}$, so that the marginal revenue curve cuts the base line on its jump below L, which marks his output after B's adjustment. It is curious that the ordinate of B' is independent of the value of c. This is because, as c diminishes, the marginal revenue curve falls; but at the same time, L, the watershed, moves up toward it just sufficiently to cut it at the same height.

If c is greater than 2, B will not encroach on A, and there is final equilibrium.

If c lies between 2 and $\frac{4}{3}$, B will not encroach on A since he will have at least $\frac{2}{3}d$ of the market to supply without encroaching and since, as we have seen, it is more profitable for this to be supplied without encroachment. A will therefore have no inducement to react in any way, and we still have a position of final equilibrium.

When c is less than $\frac{4}{3}$, B will encroach on A's customers, expecting A not to react; but A will react, he in turn making the assumption that B will not react to encroachment. B, however, will react if he is encroached upon, and the reactions may go on for a a long time. We must now consider the reactions.

Let the market be depicted by Figure 5. Then A locates himself at F. $AF = \frac{1}{2}$, and $MN = d$. The unsupplied market $PM < \frac{2}{3}d$. $SK = FK =$ the distance between B's location curve PQ and the left arm of A's Y. The demand curve is half this distance from the location curve, and the point of unit elasticity on it will lie on OK, which bisects any demand curve since its slope is c. B's sales and price will therefore be shown by T, which bisects SK, and his position will be U. Since $SU = ST = \frac{SK}{2} = \frac{FK}{2}$, UC, the distance of the right arm of B's Y from A's location curve NC, $= \frac{3}{4}FK = \frac{3}{4}SK$. Since the demand curve is half this distance from NC and is bisected by GK (the counterpart of OK), the point of unit elasticity will lie on FK $\frac{3}{4}$ of the way from F toward K. A's location will be on the point of equal height on FN, so that the left arm of his Y will now be $\frac{7}{8}SK$ as far from PQ, and B's sales and price point $\frac{7}{8}SK$ along SK. In this way the point of unit elasticity moves up from S and F toward K, reaching $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, $1\frac{1}{6}$, etc., of the way in successive steps but never quite getting there.

This procedure may not go on for long—or, indeed, for more than one step. This is because every time one of the producers raises his price in the movement from S or F to K, he also moves up his location curve and thus increases the size of the section of the market which he does not attempt to satisfy. Now, as soon

as the unsatisfied section of the market becomes equal to $\frac{2}{3}d$, the other producer will refrain from encroaching and there will be a final equilibrium. How many steps are necessary will depend upon the value of c.

The first producer on the market supplies d and leaves an unsupplied market of $1 - d$ (PM). The second producer, moving his Y $1\frac{1}{2}$ times the distance from the first producer's location curve, leaves an unsupplied market of $1\frac{1}{2}(1 - d)$. At the next step the unsupplied market is $1\frac{3}{4}(1 - d)$, then $1\frac{7}{8}(1 - d)$, and so on. The process stops as soon as one of these values $= \frac{2}{3}d$. By equating these values to $\frac{2}{3}d$, we can find what values of c necessitate each number of steps before final equilibrium is attained. The results are as follows:

Final equilibrium after one step when c exceeds	$\frac{4}{6}$, or 1.666
two steps	$\frac{12}{26}$, or 1.444
three steps	$\frac{28}{74}$, or 1.381
four steps	$\frac{44}{124}$, or 1.355
five steps	$\frac{124}{360}$, or 1.344
infinite steps	$\frac{4}{12}$, or 1.333

It can be seen that after a very few steps the movements become negligible. When $c = \frac{4}{3}$, the slight asymmetry due to the order of the producers completely disappears and the producers are located at the quartiles, each supplying half the market and charging a price of $\frac{2}{3}$.

When $c < \frac{4}{3}$ the same process of price-raising goes on until each producer is charging a price and selling an output indicated by the co-ordinates of K, and their positions are A' and B' (Fig. 5). K will be the point of unit elasticity for both of them, MG being B's demand curve, lying halfway between PQ and A', which is the base of A's left "arm," and OK being the line which bisects all B's demand curves. For A, the functions of these lines are exactly reversed.

As c diminishes from $\frac{4}{3}$ to 1, MP and VN, which equals $1 - d$, diminish and finally disappear when $c = 1$, MKV coinciding with PCN. S and F thus also coincide with each other and with K and C. This means that the producers get nearer and nearer to

each other from being at the quartiles when $c = \frac{4}{3}$ until they are both at the median when $c = 1$ or as near to each other as other conditions permit, each supplying half the market.

When $c < 1$, the first producer locates himself at the center and the other immediately goes as close to him as possible, encroaching upon half of his market. The price charged where c is between $\frac{4}{3}$ and 1 is $\frac{c}{2}$ (the ordinate of K in Fig. 5). For $c < 1$ the price is $1 - \frac{c}{2}$. For values of c between $\frac{4}{3}$ and $\frac{4}{5}$, the price of the two producers will not be the same. If c has one of the values of the series given on page 175, one will be charging $\frac{2}{3}$ and supplying $\frac{2}{3}d$, while the other will be charging less and selling more. He will be supplying $1 - \frac{2}{3}d$ at a price of $\frac{4}{3} - \frac{c}{2}$. For intermediate positions they will be in a more equal position, somewhere between these values.

XI

It has been suggested by Chamberlin,[27] who accepts Hotelling's proposition for the case of two sellers, that it does not apply to more than two. Chamberlin shows that where there are more than two competitors they will tend to disperse, and declares that "for three sellers the outcome seems to be that two of them would be located at the quartile points and the third at any point between them" and that for more "there is no more reason for sellers grouping by two's than for their dispersing." The sellers therefore may, if each chooses the mid-point of his indifference range, be "distributed at equal intervals along the line . . . . , the result being but little different from the ideal." This is not correct.

In order to give plausibility to the assumption that there is a tendency for two producers to "cluster," we must assume that each dare not cut out the other for fear of retaliation; or, better still, to avoid complications concerning the relative prices charged, we may assume that a certain fixed price is imposed on all producers so that they cannot cut each other out. The pro-

[27] *Op. cit.*, App. C, p. 194 n.

ducers will then locate themselves according to their number, as shown in Figure 10.

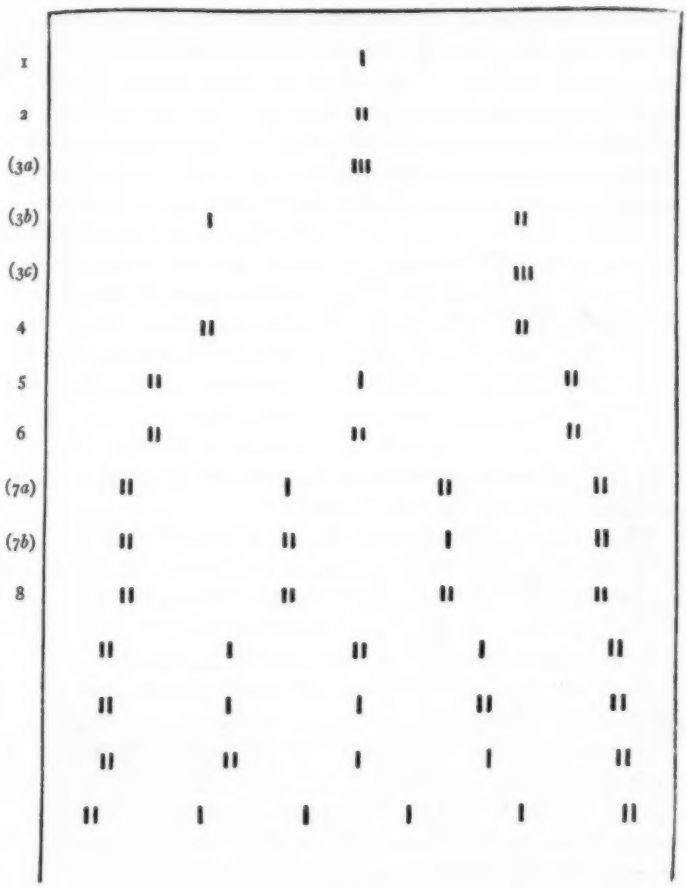

FIG. 10

One single producer will locate himself at the center of the market. Two will locate themselves as close together as possible, also at the center. The arrival of the third complicates matters.

We will assume first that each takes the location of the others as given (i.e., he assumes that they will not respond to encroachment and that he will not cut them out). The third arrival will then go as near as possible to the center, where the previous two are located. One of these will now find himself cut off from the market entirely, having a competitor on either side. He will be squeezed out of his middle position; but if he, too, considers the location of his competitors as given, he will move just past one of his competitors, imprisoning him in turn. If the movements are infinitesimal, the three producers stay at the center. If, when the middle man is squeezed out, the man on the other side moves up to fill the gap, they also remain at the center. But if, before such an adjustment takes place, the new prisoner in the middle makes a dash for the outside, there will ensue a movement illustrated in Figure 11, whereby the group is broken up into two parts.[28]

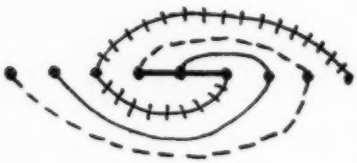

FIG. 11

The horizontal line connects the initial locations of the three producers (Fig. 11). The continuous line from the center of the straight line to a point toward the right indicates the movement of the first producer who finds himself hemmed in. The crossed line from the right edge of the straight line to a point to the left indicates the movement of the second producer to find himself cut off from the market. (We are assuming that the movements are alternatively to the right and to the left because the market on each side is being diminished in this way.) The dotted line from the left end of the straight line to a point to the right shows the escape of the third prisoner. The continuations of the smooth crossed and dotted lines show the next three movements, and so the movements continue. At any point in this movement two of the three producers are close together on one side while the third occupies a (practically) symmetrical position on the other side of the market. The movement goes on until it is no longer profitable for the middle man to go outside because the market in the mid-

[28] Compare the price movement on p. 156.

dle has grown while the producers were moving away from each other, and the market outside has diminished. This point will be reached when the producers are at the quartiles of the market (two at one quartile and the third at the other), when the middle man supplies a quarter of the market and would supply the same if he went outside.[39]

The lucky one who has a quartile all to himself will be making twice as much profit as either of the others. This will not affect the stability of this position since it will not pay either of the others to come over to his side. The stability is upset, however, by the possibility open to the lucky one of making his profits greater still by moving toward the others. If he goes right up against the others, he will be able to supply $\frac{3}{4}$ of the market instead of $\frac{1}{2}$. This gain is only the extreme case of the gain from shifting up, which we excluded before because the other movements (which had a far greater incentive) anticipated it. Now that the other movements come to a stop, there is no longer any reason for this being withheld. The lucky one will therefore do this and thereby destroy his luck, for the imprisoned middle man again escapes; and the story is repeated after the whole group has moved together to the center of the market (for each escaping prisoner chooses the large market on the side nearer the center). Thus positions *3a*, *3b*, and *3c* of Figure 10 represent the turning-points in an unstable cycle.

Three is the only number of competitors which does not give any position of stable equilibrium on these assumptions. If a fourth producer comes in, the position shown in Figure 10 is reached with stable equilibrium, two producers being located at each quartile. If the fourth man comes along when the position is as shown on line *3b*, he will naturally locate himself next to the lucky one, and final equilibrium is immediately reached. Every producer is supplying $\frac{1}{4}$ of the market, and no one can gain by moving. If the fourth man comes along at any other position, the two inside men go outside, and the four find themselves in two separated pairs. No pair can be in equilibrium if one of them sells

[39] Or to the center. All the time one producer is imprisoned, his location between the two others is indeterminate since wherever he is between these two he will supply half the market lying between them.

more than the other, for in that case the other will change sides. This has the effect of making any pair move to a point $\frac{1}{3}$ of the distance from the edge of the market to the next competitor. This is because the producer who is between his partner and the other competitor supplies only half the intervening market, while the producer facing the edge of the market supplies the whole of the market between him and the edge. In this way the two pairs move to the quartiles, where a stable equilibrium is established.

A fifth producer would be able to supply $\frac{1}{4}$ of the market by locating himself either just outside one of the quartiles or anywhere between the quartiles. If he chooses the median, the pairs at the quartiles will move away from him until their distance from him is twice their distance from the edges of the market. There will then be final equilibrium, with the fifth man supplying $\frac{1}{3}$ of the market, each of the other four supplying $\frac{1}{6}$. If he chooses an inside position not the center, his competitors on the side farther from him will be selling more than those on the same side as he, and one of the latter will be tempted to go over to the other side, imprisoning one of the pair already there. The partner left alone will move up to the newcomer to form a pair with him. The pairs again move to positions $\frac{1}{3}$ of the distance from the edge toward their nearest competitors, and the movements continue until a lone producer occupies the center, as shown in line *5*. If he chooses to go on the outside of one of the pairs, the trio thus formed will break up in the usual way, excepting that the steps of the escaping prisoners will not be alternatively right and left. For each that goes toward the edge, three will go toward the center. This is because each movement of one unit to the edge diminishes the market there by a whole unit; but a movement of one unit toward the center diminishes the market by $\frac{1}{2}$ because part of the burden falls on the seller at the other end and there is then a gain of $\frac{1}{6}$ due to the other pair moving $\frac{1}{3}$ of a unit away when their competitor moves one unit toward them (as they wish to keep $\frac{1}{3}$ of his distance from the edge). The movement of three steps to the center for each step to the edge will finally take one section of the trio to the center and the other to a point $\frac{1}{6}$ of the market from the edge. If the center section is an individual producer, we have the final equilibrium (*5*). If the center section is the pair, the end one

moves up to it, so that a new trio is formed, which splits, with a pair going off to $\frac{1}{6}$ from the edge and leaving an individual in the center; and so there is final equilibrium.

The same procedure can be applied for other numbers. We find that the producers congregate in pairs and that these pairs locate themselves at the socially optimum positions for half the number of individual producers. This makes transport costs exactly twice what they should be with the existing numbers of producers. Where there is an odd number other than three, the position of one of the pairs is taken by an individual producer without prejudice to the stability of the equilibrium, although his sales and profits are twice those of any of the others. The lone producer cannot be at the end of the line of producers (in the sense that there is no producer between him and the edge) because, if that were the case, he would move up to the next producer.[30] It is possible for equilibrium positions to exist with any number of lone producers, but there is no tendency for a further dispersion when they are arranged in pairs. In general, if there are n producers, they can be arranged in m groups where m is any number between $\frac{n}{2}$ and $n - 2$, each group consisting of one or two producers, the end groups consisting necessarily of two producers and the location being $\frac{1}{2m}, \frac{3}{2m}, \ldots, \frac{2m-1}{2m}$. It is not possible for n producers to be spread over n different places either evenly or unevenly.

If each producer learns that the location of the others is not given but is dependent upon his own position, this will bring the final position of equilibrium about more quickly. If each assumes that the others will choose locations on the assumption that *his* location is fixed, he will never settle next to a pair, since he knows that the middle man will be squeezed out and will imprison him in turn. If there is a lone producer when he comes into the field, he will join him. If there is no lone producer, he will locate himself in between two pairs of producers, where he will ini-

[30] That is why there can be no final equilibrium when there are only three producers, as there are not enough to provide the pairs that must be found at the ends of the line of producers so that individuals may be in equilibrium within the line.

tially supply half the distance from one pair to the other. The pairs on whose market he has encroached will move away so as to equalize the sales on either side; this will induce the next two pairs to move away again, but by a smaller amount; and so the movement will spread throughout the market until the final position is reached with each pair supplying as much as any other pair and the newcomer also supplying this amount by himself, i.e., he will sell twice as much as any other producer until the next producer comes along, when he will find his sales divided between himself and an undesired partner.

XII

If we drop the sixth assumption, so that the producer now pays the transport costs, this will permit perfect discrimination, and the analysis is much simpler. "Price" will now mean price *delivered* and not price at the source. The demand curve for a single seller (PV in Fig. 1) now becomes a marginal revenue curve; and since it cuts the base line at $2d$ from the Y-axis, the seller would like to supply $2d$ instead of d. He would charge every customer his demand price, so that the seller's conditions of supply can be illustrated by a letter V instead of a Y. Such a figure is MAN of Figure 12. A is the location of the seller; M and N are the limits of the market supplied by him (his marginal customers). The slope of AM and AN is c. The ordinates of points on these lines, however, do *not* represent the price to customers, since all customers pay the same (delivered) price. The ordinates of these lines show the cost to the seller of supplying the commodity on the customer's doorstep.

If $c > 2$, a single seller will have an indifference range of $1 - 2d$. If $c \leqslant 2$, he will locate himself at the center of the market. His profits are shown by the area contained in the V. If $c > 2$, some of the V is cut off at the edges, and the smallest area is cut off for any horizontal distance if the sections cut off on each side are equal. This can be expressed by saying that he maximizes his profits when his marginal revenue is the same at both margins. If this were not the case, i.e., if the excess of demand price over cost of transport were not the same for the two customers at the edge of the market, he could increase his profits by moving one

unit toward the side where the marginal revenue is less, since this would add an amount equal to the larger marginal revenue while subtracting an amount equal to the smaller marginal revenue. This is the general condition for maximizing profits, so that in the final equilibrium every seller must be getting the same marginal revenue (and therefore incurring the same transport costs) from his marginal customers. This means that any seller will, if he is between two other sellers, locate himself exactly halfway between them; while if he is between another seller and the edge of the market, he will go to the point $\frac{1}{3}$ of the way from the edge to his

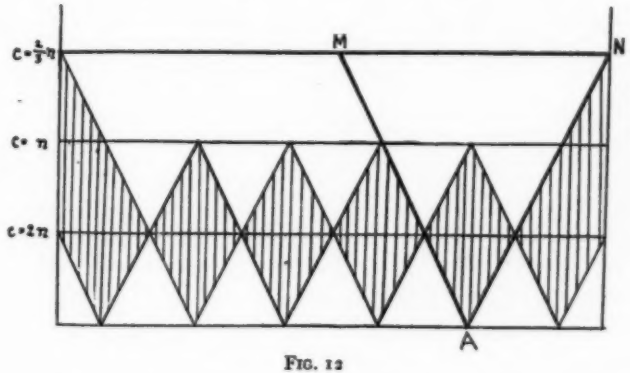

FIG. 12

competitor. This means that competitors will always arrange themselves on the pattern shown in Figure 12 if they are in competition with each other. This arrangement is the ideal arrangement in the sense of minimizing the costs of transport for this number of sellers. It will be observed that each discriminating seller behaves just like a pair of non-discriminating sellers. The locations are (with n sellers) $\frac{1}{2n}, \frac{3}{2n}, \ldots, \frac{2n-1}{2n}$. The letter V, which shows the minimum price at which any seller would supply any customer, also shows the maximum price which any other seller can charge that customer. When two V's intersect, the point of intersection divides the market between the two sellers, and the portion of the other's V in his own market shows the maximum price he has to charge. Where several V's intersect each other,

the difference between cost and price charged is shown by the diamond-shaped segments between the bottom of each V and the lowest of the other V's that cut across his. These are shaded in Figure 12 and show the profits of each seller. If $c \leqq \frac{2}{3}n$, each seller makes $\frac{1}{3n}$ except for the two end ones, which make $1\frac{1}{2}$ times this amount, or $\frac{1}{2n}$. The prices charged to customers are shown by the upper edge of the shaded area; and the cost of transport (of each unit), by the lower edge of the shaded area. This means that those customers who are located near a seller will have to pay the highest price, while those who are farther away from a seller will pay less, those customers who are farthest from a seller paying least. This is because the customer who is nearest to a seller is farther from his competitors and so can be exploited more.

If $c > \frac{2}{3}n$, part of the shaded area of the end sellers will be cut off, i.e., some of the customers will have to pay the full demand price. When $n = 2$, this gives us the familiar figure $\frac{4}{3}$. When c reaches n, the tops of the diamonds will touch the top of the figure. This means that the highest prices charged by every seller are equal to the demand price and that the lowest prices are $\frac{1}{2}$. There will be one customer charged the full demand price by each seller except the end ones. Each of these end sellers will be supplying $\frac{1}{2n}$ customers at the demand price, while their profits will have fallen from $1\frac{1}{2}$ to $1\frac{1}{4}$ times that of the others.

Where $c > n$ but $< 2n$, more and more is cut off the tops of the diamonds and more and more customers have to pay the full demand price. When c reaches $2n$, everybody pays the full demand price and each seller supplies $2d$ customers. At this point the end sellers lose all their advantage.

Where $c > 2n$, n sellers will not want to supply the whole market. Some of the market will be unsupplied, and there will arise ranges of indeterminacy as to which parts of the market are supplied.

XIII

It is, of course, possible to drop the rigid assumptions that have been made in the course of the analysis. while still making

use of the technique developed above. We may conclude with some hints as to how the method could be applied to closer approximations to reality.

If transport costs do not vary directly with the distance the commodity is transported, this can be dealt with by making the arms of the V or Y curved instead of straight. Tapering transport costs will be shown by the curves being convex upward, and increasing rates will be shown by concave curves. The same procedure is applicable to the case where the producer is able to buy his transport at a lower rate if he does more business with the railway company, and also to the case of increasing or decreasing (marginal) costs of production. Where the curves are concave upward, an individual producer will always charge a price $> \frac{1}{2}$, and vice versa. A limit to the amount any competitor can produce or sell will be the limiting case of the concave curve, where the upturn is sudden.

Where the costs of transport are different for transport in the different directions (as in transport upstream and downstream), the slopes of the arms will be different.

Where the costs of transport are different on different parts of the road, the slope of the arms will vary in accordance with this. Where the density of consumers varies along the road, this can be dealt with by taking as the unit of length of market the number of consumers. This will mean that thickly populated parts will be drawn out for the diagram and that sparsely populated parts will be telescoped together. This will affect the transport costs, as shown by the flattening and steepening of the slopes when the diagram is drawn out and shortened in this way. Where population is dense, transport cost from one customer to the next is less than where population is sparse, so that this phenomenon can also be dealt with by variations in the slope of the arms along the road.

Where the demand price is not the same for every customer, the top of the figure is no longer a straight horizontal line but moves up and down to show the local demand price. In the same way, variations in the cost of production with location can be shown by making the bottom line of the diagram move up and down so as to portray this.

We can also deal with customers whose demand is not of the peculiar form so far assumed of zero elasticity with a given upper limit to price. Where a customer's demand has some elasticity, the demands for further units at lower prices must be considered as demands at the standard price located at points farther from the source of supply than the customer actually is by a distance over which the cost of transport is equal to the reduction in price. This is because a demand for a unit at a lower price is equivalent to a demand for a unit at the standard price by a customer farther away by this distance. This gives us our figure again with a horizontal top. This translation of part of the customer into the middle distance will have the effect of altering the density of the supposed population with effect on the transport costs. If the demand curves of the customers are all similar, the virtual population will be scarcer in the vicinity of the seller than anywhere else, increasing in density until a distance equal to d (the distance over which a unit can be transported at a cost equal to the demand price for the first and most urgent unit) from the source, and remaining constant thereafter. The density does not increase beyond this point, for this is the point to which the lowest point on the demand curve of the customer located at the source has been supposed to move. The stretching-out of the market so as to make the density uniform will have the effect of making the transport cost less as one moves away from the source, so that the slopes will be convex upward. This will make the price less than $\frac{1}{2}$, which is what one would expect from the increase in elasticity of demand that follows from the mitigation of the assumption of zero elasticity. It may be convenient, for this purpose, not to take each unit of demand separately but to divide a demand curve into a manageable number of sections, as one does in discriminating monopoly of the second degree.

Finally, we may note that the consideration of costs of movement will be an important stabilizing influence, since it will make it not worth while to a seller to move unless his expected gain is sufficient to cover the interest on the cost of movement and the repayment of the outlay over the expected duration of the benefit.

VENETIAN BANKERS, 1496–1533: A STUDY IN THE EARLY STAGES OF DEPOSIT BANKING

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THE development of negotiable commercial paper in the seventeenth century marks the end of the "primitive" stage of deposit banking. Earlier bankers, unable to discount bills so as to spread the risk of their loans over a multitude of mercantile operations, were lured into overambitious ventures. They held a volume of deposits which enabled them, in ordinary times, to satisfy their depositors without keeping all their funds on hand in cash. But their efforts to draw profits from the money intrusted to them led to direct participation in commercial undertakings and loans to princes. Such firms as the Bardi of Florence or the Welsers of Augsburg touched dazzling profits, grew bolder, and, engaging their depositors' funds yet more deeply in government loans or speculations in commodities, ended in sensational failures. The well-known stories of such international bankers leave the impression that the great dangers of bank failure in that early stage of deposit banking came from the two sources named —commercial speculation and loans to princes.

The international bankers supplied the needs of some centers; those of other cities were met by local banks. The latter were sometimes profit-seeking ventures of private bankers, sometimes public institutions subject to the city government. Although the municipal banks of Barcelona (1401) and Valencia (1407) have sometimes been confused with *giro* banks, on the assumption that they merely transferred payments on their books and did not make loans, this is a mistake. *Giro* banks did not come into existence until the late sixteenth century, at Venice in 1584 and at Amsterdam in 1609. It is true, however, that the chief function assumed later by the *giro* banks had been performed earlier by the public or private local banks. Through the transfers of deposits

from one account to another, they furnished a method of making payment which was easier than handling coins.[1]

Venetian banks about 1500 were primarily local banks. They have been studied hitherto almost entirely from a single type of source, namely: official enactments.[2] The difficulty with this source is that the texts of laws tell little concerning their enforcement. A fuller picture of the activities of the Venetian banks may be gained from contemporary chronicles and diaries.[3] The diary of Marino Sanuto has almost the reportorial scope of a newspaper, and permits piecing together a picture of the opportunities and dangers facing the Venetian bankers during the years 1496–1533.

Like international banking firms, the Venetian bankers indulged in risky ventures in trade and government finance. But two other factors also threatened their solvency. One was connected with the tight-money crises produced by the Venetian system of war finance; the other with the temptations arising from coinage difficulties and from the fluctuation of the market ratio of gold and silver. Judged by the history of the Venetian banks from 1496 to 1533, these two factors were more responsible for banking difficulties than were short-term loans to the government or excessively ambitious commercial enterprises.

Sanuto describes the fortunes of the ten banks of his time.

[1] Abbott Payson Usher, "The Origins of Banking: The Primitive Bank of Deposit, 1200–1600," *Economic History Review*, IV (1932–34), 401, 406–9; Armando Sapori, *La crisi delle compagnie mercantili dei Bardi e dei Peruzzi* (Florence, 1926); Richard Ehrenberg, *Das Zeitalter der Fugger* (Jena, 1912), I, 193–211.

[2] E. Lattes, *La libertà delle banche a Venezia dal secolo XIII al XVII* (Milan, 1869); Fr. Ferrara, "Documenti per servire alla storia dei banchi veneziani," *Archivio veneto*, I (1871), 107–55, 332–63; and "Gli antichi banchi di Venezia," *Nuova antologia*, XVI (1871), 177–213, 435–466. The documents published by Lattes and Ferrara were the basis, as far as the period here considered was concerned, of the studies of Charles F. Dunbar, "The Bank of Venice," *Quarterly Journal of Economics*, VI (1892), 308–35, and of E. Nasse, "Das venetianische Bankwesen in 14, 15, u. 16 Jahrhundert," Conrad's *Jahrbücher für Nat. Ok. u. Statistik*, XXXIV (1879), 329–58. Ferrara referred to material collected from private sources but all that appeared in the *Archivio veneto* were official acts.

[3] Marino Sanuto, *I diarii* (58 vols.; Venice, 1879–1903); Domenico Malipiero, "Annali veneti dell'anno 1457 al 1500," *Archivio storico italiano*, Vol. VII (1st ser.; Florence, 1843); Gerolamo Priuli, *I diarii*, in *Rerum italicarum scriptores* (2d ed.; Citta di Castello, 1911), Vol. XXIV, Part III.

These were: (1) the Garzoni: founded in 1430 by Messer Nicolo di Bernardo e compagni; passed under direction of Andrea Garzoni; failed in 1499; reopened and failed again in 1500;[4] (2) the Lippomani: founded in 1480 by partnership of Tommaso Lippomano and Andrea Capello, managed in 1499 by Girolamo Lippomano; failed in 1499;[5] (3) the Pisani: founded in 1475, liquidated paying in full in 1500; reopened in 1504; liquidated paying in full in 1528, after the death of Alvise Pisani who had managed it;[6] (4) Matteo Agostini: survived the crisis of 1499 but failed in 1508;[7] (5) Girolamo di Priuli: founded in 1507; forced to liquidate in 1513;[8] (6) the Capelli: founded in 1507 by Antonio, Silvan, and Vettor Capello and Luca Vendramin; continued after 1528 by Silvan Capello and sons;[9] (7) Matteo Bernardo: founded in 1521; liquidated, paying in full, in 1524; reopened in 1529;[10] (8) Antonio di Priuli: founded in 1522 in close alliance with the Pisani bank and continued until 1551;[11] (9) Andrea e Piero da Molin: founded in 1523, forced to liquidate in 1526;[12] and (10) Andrea Arimondo: founded in 1524, failed in 1526.[13]

These were probably all the banks existent in Venice between the triumphant liquidation of Pietro Soranzo in 1491 and the opening of a new group of banks about the middle of the sixteenth century.[14] The list does not include mere money-changers,[15] nor

[4] Sanuto, II, 391; Malipiero, p. 531.

[5] Malipiero, p. 671; Sanuto, II, 723.

[6] Ferrara, in *Nuova antologia*, XVI, 198; also Sanuto, III, 158; V, 942; XLIX, 124, 240.

[7] Malipiero, p. 716; Sanuto, VII, 283.

[8] Sanuto, VII, 30; XVII, 328, 354, 369.

[9] Sanuto, VII, 81; XLIX, 7.

[10] Sanuto, XXXI, 182; XXXVI, 484; LI, 132–33.

[11] Sanuto, XXXIII, 545–46; Ferrara, in *Nuova antologia*, p. 438.

[12] Sanuto, XXXIV, 279; XLIII, 376, 388.

[13] Sanuto, XXXVI, 203; XLIII, 57, 80.

[14] Ferrara (*Nuova antologia*, XVI, 185–207, 434–51) gives the same names for the bankers of these years, but is not in all cases informed concerning the years in which they operated.

[15] Mentioned as a quite distinct business, but as being in debt to the banker (Sanuto, III, 1040; Priuli, I. 112). The law of 1528 (Lattes, p. 95; Sanuto XLIX,

does it include the Jewish banker, Anselm, who during this interval performed many of the functions of contemporary Christian bankers.[16] The ten firms named were the *banchi di scritta*, those which did business by writing transfers of deposits from one account to another. Payments from one merchant to another were made by the two parties appearing before the banker and personally ordering the transfer made on his books. This was a great convenience both because it avoided the slow counting-out of imperfect coins and because the entry on the banker's book was an official record of the whole transaction which made unnecessary any other legal papers.[17]

These *banchi di scritta* were essential to the economic life of the city. The total deposits of the four banks doing business in 1498 were something over one million ducats.[18] The number of depositors of the Lippomano bank at the time it defaulted was 1,248, of whom 700 were Venetian nobles. If it were assumed that the other two large banks of the time had a similar number, and if no allowances were made, on the one hand, for those having accounts in more than one bank or, on the other hand, for those who got out before the crash, the figure for the total number of bank depositors would be about 4,000. This would mean that one out of every thirty of the population of Venice had a bank ac-

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89) said they had begun to accept coin on deposit at illegal rates and forbade it, but it is unlikely that they had become a means of avoiding the bank laws to any great extent or there would have been more comment in Sanuto.

[16] Sanuto, XXIII, 182, 407. The Jews had a different legal status.

[17] Dunbar, pp. 311–14; Lattes, p. 125.

[18] The Garzoni failed in February, owing between 96,000 and 250,000 ducats, and said they had paid out 128,000 ducats since Christmas (Sanuto, II, 391, 401). The Lippomani owed about 120,000 ducats, and it was said they had paid out 300,000 ducats (Malipiero, p. 715; Sanuto, II, 731). The Pisani, after two severe runs on their bank, had more than 95,000 ducats in deposits left (Sanuto, III, 158–59). They had stopped one of the runs by raising a guaranty fund of 320,000 ducats, besides a previous reserve of 100,000 ducats in government bonds (Priuli, I, 124). The Agostini deposits were at that time less (Malipiero, p. 716). Any exaggeration by the bankers of the withdrawals immediately before the failures is probably more than offset by the previous slow drain of deposits. The *Banco di Rialto* had liabilities in 1588 of 546,082 ducats, in 1594 of 705,889 ducats (Lattes, pp. 163–64).

count. When Lippomano closed down, more than 600 of his depositors had accounts of less than twenty ducats. His enemies reviled him for the loss of the dowries of young maidens, of savings which had been put aside in presumed safety by citizens and nobles for the payment of taxes, and of the deposits of monasteries and hospitals. Obviously, besides the big accounts of merchants, the bankers carried many small accounts and many not mercantile.[19]

Some of the funds in the bankers' hands were what may be called "conditioned deposits," deposits earmarked for specified future payments under certain conditions. The many deposits which were intended for dowries may be considered in this class.[20] The guaranties which the renters of the state merchant galleys gave to the state might be in the form of deposits made by the guarantors in the banks.[21] Tax collectors had on deposit in the banks funds which could be seized in case they did not fulfil their commitments.[22] On some occasions the bankers may have guaranteed future payments without requiring a deposit. References in the diary to payments guaranteed by a banker frequently do not make clear whether the banker had received a deposit to be used for the purpose.[23]

Of the ten banks listed, only four ended definitely insolvent—not as bad a record as is usually implied.[24] In all four failures, those of the Garzoni, Lippomani, Agostini, and Arimondo, a statement of the resources remaining after the bank had failed was attempted by Sanuto. These figures include, besides the assets of the bank, all the available possessions of the banker.

[19] Sanuto, IV, 244–45; V, 654–55, 1056–57. The second Garzoni bank had only 518 creditors when it failed in March, 1500 (Sanuto, V, 707) but this was the bank opened within a year after its failure in 1499. To it were transferred the accounts of those large creditors, from 20 lire up, who agreed to wait for this money. To the others the Garzoni offered their money at once (Sanuto, III, 96–98; Priuli, I, 260–61).

[20] Usher, *op. cit.*, pp. 413–14; Sanuto, II, 425–26; IV, 245.

[21] Sanuto, II, 732. [22] Sanuto, II, 120. [23] Sanuto, II, 452; III, 112.

[24] Ferrara, in *Nuova antologia*, XVI, 442, 459–60; P. Molmenti, *Storia di Venezia nella vita privata* (Bergamo, 1925), II, 38–40. With more reserve, Dunbar, p. 319; Roberto Cessi and Annibale Alberti, *Rialto* (Bologna, 1934), pp. 300–301.

LIPPOMANI*

	Ducats
Liabilities	*ca.* 120,000
Assets	
Private loans	18,000
Jewels	14,000
Real estate	12,900–27,500
Cash	10,000
Government bonds and interest	34,000–41,000
Credits against Salt Office	18,000
Advances to the government, unsecured	8,000
	114,900–136,500†

* An attempt to combine and reconcile: Sanuto, II, 731, 738–39; III, 1066; V, 1056–57; Priuli, I, 122–23; Malipiero, p. 717.

† Plus personal debtors for unknown sums.

GARZONI‡

		Ducats
Liabilities		96,000 to 200,000
Assets		
Total loans	55,000 or 85,000	
Less bad loans	10,000	
Net loans		45,000 or 75,000
Jewels and silver		15,000
Government bonds and interest		20,000
Real estate		45,000
		125,000 or 155,000

‡ Sanuto, II, 391, 401; Malipiero, p. 531.

AGOSTINI§

		Ducats
Liabilities		110,000
Assets		
Good private loans		10,000
Jewels		25,000
Real estate		Undetermined
Cash		
At state treasurers	3,000	
At mint	6,000	
Net cash		9,000
Government bonds		Undetermined

§ Sanuto, VII, 283, 298, 307. An arrangement for payment over two years was approved (Sanuto, VII, 722).

ARIMONDO||

		Ducats
Liabilities		
Total debts	27,000	
Less insured debts¶	16,000	
Net debts		11,000
Assets		
Merchandise		
On ships		Indeterminate
Alum or potash in warehouse		1,500
Government bonds		1,500
Real estate, Jewels		Value not stated, but believed sufficient to cover the balance by more than 6,000 ducats

|| Sanuto, XLIII, 80, 144.

¶ This passage reads: "..... Il debito è ducati 27 milia, et asegura di questa per ducati 16 milia....." In the report of the run on the Molin bank in 1526 it was said "..... Voleno asegurar et pagar tutti...." (Sanuto, XLIII, 376). When news of riots in Alexandria reached Venice in 1524, the credit of Matteo Bernardo suffered, and he sought insurance (Sanuto, XXXVI, 146, 149). There are no similar references to insurance during the crisis of 1499.

These figures are probably not often accurate, for they were gathered from common rumor, or the avowals of the defaulting banker, or the impressions of the receivers when they first took over the closed banks. They are nevertheless valuable, for Sanuto's repeated references to the same categories of assets, even when he was unable to state the amounts, reveal the accepted categories of bankers' resources. These were long-term government bonds, short-term credits secured by assignments of income to be received from governmental bureaus, personal loans, jewels, real estate, cash or bullion, and merchandise.

In these financial statements no distinction has been made between the personal resources of the bankers and those of the banking enterprises. Even though such a distinction was made in the account books, it was of little legal importance, for the banker was fully liable for the debts of the bank.[25] Only in the

[25] Even the heirs of Nicolo Bernardo were held as principals to pay the debts of Garzoni's first bank, although they claimed that for years they had had nothing to do with the bank except as guarantors of 2,000 ducats each. But because their

case of the Lippomani is there given an accounting in which any distinction is drawn between the assets of the bank and those of the bankers:[26]

LIPPOMANI BANK

	Ducats
Liabilities ..... *ca.*	120,000
Assets	
Loans, good	18,000
Loans, bad	4,000
Due from Soranzo, silversmith for the bank	20,000
Due from good debtors of Soranzo	18,000
Due from the Cappelli, former partners	13,000
Due from the Lippomani personally	17,000
Cash	10,000
Unsecured advances to the state	8,000
	108,000

Most of the assets of the Lippomani bank, at the time of its failure, were loans due from the Lippomani personally or their business associates. Similarly in Agostini's failure, the Agostini were the chief debtors of their bank. Perhaps other and sounder bankers financed their mercantile ventures largely out of their own capital and borrowed less from their banks. Agostini and Lippomano were the two bankers most blamed for dishonest banking. This may have been more because of their attempts to avoid the liquidation of all their personal possessions to pay the debts of the bank[27] than because of their excessive borrowing from their banks. But the combination was certainly damning. Practically, the resources of the bank and of the banker were considered the same, and he was counted the dishonest banker who tried to keep his own wealth after he had taken that of his depositors.

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names still appeared in the firm and they shared in profits, they were sentenced to pay (Sanuto, IV, 304).

[26] Sanuto, II, 738–39. From Lippomano's own account, but he gives the total assets as 98,000 ducats, apparently allowing for some duplication in the accounts with Soranzo. Soranzo's debt is elsewhere put as high as 40,000 ducats (Sanuto, III, 1017, 1066).

[27] Sanuto, VII, 307; II, 731.

Which types of investment were made in the name of the bank, and which in the name of the banker, or that of his son or of a business associate, is a question of bookkeeping which from the diarist sources can be answered only tentatively. Long-term government bonds, merchandise, and real estate generally appear to have been assets of the banker, not assets entered on the books of the bank. Mercantile ventures were probably not made in the name of the bank although they were financed by loans from the bank to the banker and his associates.[28] On the other hand, personal loans, loans on jewels, and short-term credits to the government were, quite clearly, investments made in the name of the bank.

The distinction was of little importance to depositors so long as all the banker's resources were fully liable for the debts of the bank and the banker used the resources of the bank for his trading ventures. Contemporary references, including those of Girolamo Priuli, a merchant and banker himself, make practically no distinction between the affairs of the bank and those of the banker. When there was a run on the bank the important question was how much cash could the banker and his family realize from all their resources. In sixteenth-century Venice banking was not a specialized business; it was a part of the larger operations of merchant nobles.

The purchase of silver bullion from German importers was an important function of the banks.[29] When the Garzoni failed they were found to have suffered heavy losses from buying silver at a price above the mint ratio in order to increase their specie reserves.[30] The Lippomani not only financed the silversmith Soranzo, but they also bought silver themselves by giving credit for it on their books.[31] The Pisani are pictured as one of the chief silver customers of the Fuggers.[32] When in the autumn of 1500 there

[28] Alvise Pisani acting in the names of his son and others (Sanuto, XXVI, 48, 495; XXVII, 219).

[29] Despite the laws (Lattes, pp. 34, 55, 70).

[30] Sanuto, II, 391; Malipiero, p. 531.

[31] Sanuto, II, 736.

[32] Alfred Weitnauer, *Venezianischer Handel der Fugger*, in *Studien zur Fugger-Geschichte*, IX, 96, 171.

was no bank left at Venice save that which had been the smallest, that of the Agostini, the German merchants complained before the doge that they had no satisfactory market for their silver. Agostini would buy only on his own terms. Therefore the bullion was not finding its way to the mint.[33]

Jewels played a consistent part in the bankers' reserves, for they were extensively used as securities for loans. The Venetian bankers were pawnbrokers not only for princes but for men of lower station. Bernardo loaned on jewels to the pope, Garzoni to the Marquis of Mantua, Agostini to an army captain who had pawned his wife's wedding ring.[34] These firms combined the now distinct businesses of pawnbroking and commercial banking.

Merchandise and shipping occupied a larger part of the bankers' funds than is suggested by the statements of the assets left in the defaulting banks. During the crisis of 1499 the Pisani had about 40,000 ducats invested in the "western voyage," in wool and in cloth, and they had recently purchased a large ship.[35] During the winter of 1518–19 a combine headed by the Pisani bank financed the voyages of the merchant galleys of Flanders and Barbary.[36] The Molin bank had much of its resources in merchandise.[37] The bankers Antonio di Priuli and Matteo Bernardo were counted among the four leading merchants of Alexandria,[38] and in 1533 Bernardo was accused of seeking to monopolize the export of English wool to Venice.[39]

The loans of the banks, both to private individuals and to the state, were more voluminous than shown by the statements of the defaulters. Loans to merchants were in the form of overdrafts, sometimes for hundreds of ducats, sometimes for thousands.[40] Very large credits were extended to the state, but the dangers to

[33] Sanuto, III, 1091; cf. II, 736, 930.

[34] Sanuto, LV, 79; II, 736; III, 862.

[35] Sanuto, I, 780, 935; Malipiero, p. 551; Priuli, I, 124.

[36] Sanuto, XXVI, 48, 495.

[37] Sanuto, XLIII, 394.

[38] Sanuto, XXXVI, 146, in 1524.

[39] Sanuto, LVIII, 249, 257.

[40] Sanuto, II, 391, 487. Cf. the apparent prohibition in 1467 of any large loan on one signature (Lattes, pp. 72–73). Cf. Dunbar, p. 315. But could not this be interpreted as limiting only the loans made by a single member of the banking firm?

the banks of these advances have been overemphasized.[41] The defaulting bankers did not have any large percentage of their funds in short-term loans to the government.

The bankruptcies which occurred between 1496 and 1533 cannot be ascribed to the failure of the government to repay loans from the banks. In the first part of this period, however, the bankers suffered from dangers arising in connection with the funded debt and the system of war finance. The financial panic of 1499–1500, in which the Garzoni and Lippomani failed and the Pisani, although hard pressed, paid 100 per cent, came during a political crisis. In 1499 Venice was involved in war on two fronts and was obliged to maintain an army in Lombardy at the same time that it armed its navy to match the fleet which the Great Turk was preparing at Constantinople. Although wars were a constantly recurring feature of Venetian life, they were all treated financially as if they were unusual emergencies. They were financed by forced loans levied upon all the well to do in proportion to their wealth. In return for the payment of a fraction of his wealth the investor, for so we may here call the taxpayer, received a government obligation. Since interest was paid at 4 or 5 per cent, these government bonds would have been possessions welcome to the taxpayers had they not been issued in excessive amounts. When they were forced out too rapidly, however, some people did not have enough ready money to pay for their new allotments. Since the bonds formed a forced loan to which the taxpayers had to subscribe, many taxpayers were forced to sell the government bonds they already possessed in order to pay for their share of the new issue. These sales drove down the price of the bonds. When the government then proceeded to demand more loans, the low price of his old bonds increased the difficulties of the taxpayer in finding the funds needed to buy the new bonds. Collection of the loan became extremely difficult, despite the seizure of the property of those who failed to subscribe. Rendered desperate by mounting war expenses and difficulties of collection,

[41] Ferrara, in *Nuova antologia*, XVI, 204–13, 459–60; Molmenti, II, 38–40; Enrico Magatti, "Il mercato monetario veneziano alla fine del secolo xvi," *Nuovo archivio veneto*, XXVII (new ser., 1914), 245.

the government issued yet more bonds and these forced the price even lower. The first series of government bonds of this type, the *monte vecchio*, became so depreciated that they were abandoned and in 1482 a new series started called the *monte nuovo*.[42] But these also were issued in excessive amounts. From eighty in 1497 their price dropped to fifty-two in 1500.[43] Property to the value of more than 300,000 ducats was in default for tax payments, but no one would buy.[44] This "tightness" of money produced by excessive demands on the taxpayers and the great military expenditures were the chief explanations of the 1499 failures offered by contemporaries.[45]

It is easy to imagine how these excessive issues of government bonds reacted unfavorably on the banks. Clients withdrew funds to pay for the government loans.[46] A good part of the bankers' personal wealth as well as that of their friends and relatives was likewise absorbed by the government bonds, and the guaranty funds, which the state required from all the bankers, were, at that time, composed of such bonds.[47] These securities diminished in value on the very occasions when they were most needed because the banks were endangered by the withdrawal of funds by depositors. It was the general dependence on the money market, which in turn depended on the volume of government borrowing and taxation, which placed the bankers in jeopardy, not demands for loans made on the banks by the government. When Andrea Garzoni revealed his embarrassment, the state repaid what it

[42] Gino Luzzatto, *I prestiti della Republica di Venezia* ("Doc. finan. della Rep. di Venezia" [3d ser.; R. Accademia dei Lincei, 1929], Vol. I, Part I), carries the story of these loans to 1482.

[43] Priuli, I, 71, 141, 321; II, 7, 27; also Sanuto, I, 575.

[44] Sanuto, II, 1121–22; Priuli, II, 61, 64; Malipiero, p. 532.

[45] Sanuto, II, 391–92; Malipiero, p. 532; Priuli, I, 290–91. I presume that most of the funds borrowed were disbursed outside Venice—e.g., to the army in Lombardy, to merchants bringing wood, iron, and copper from Germany, and to the fleet at Corfu.

[46] Sanuto, II, 391.

[47] Sanuto, II, 726; Priuli, I, 124; Lattes, pp. 71, 81–82. The investments in government bonds were not made by bankers as bankers but as individuals and as taxpayers. There is no evidence that the government demanded or even urged on the bankers the purchase of these government bonds.

owed to his bank.[48] The failure to settle promptly with Girolamo Lippomano was not the reflection of a general situation but the result of personal attacks on Girolamo.[49]

The depression of 1499 was short-lived. By December, 1502, government bonds, *monte nuovo*, were again selling at seventy-five.[50] The failure of the Agostini in 1508 was attributed to no other cause than their own incapacity or dishonesty. Agostini owed his bank 65,000 ducats out of the 110,000 due, and had sent his wife, sons, and personal wealth off to Mantua a month before, ". . . . so that one may say he wished to fail with the money of others."[51]

Another crisis similar to that of 1499 came in 1509 when all the great powers of western Europe were leagued against Venice. In that emergency interest payments on the *monte nuovo* were suspended. There was a run on the Pisani bank. Pisani went to the government for help, received 15,000 ducats in cash, and with the aid furnished by his wealthy relatives outlasted the panic.[52] No banks failed that year, yet Girolamo Priuli may be considered a victim, indirectly, of the crisis of 1509. He was forced out of business in 1513. His extension of credits to the government was a factor in his closing, but the basic element in his misfortune was his personal loss of 10,000 ducats by the suspension of payments on the *monte nuovo* in 1509. He did not fail, technically speaking, for many of his creditors accepted payments in credits on the government and his bank was not placed in the hands of receivers.[53]

There remained, from 1513 to 1521, the great bank of Alvise Pisani, and the more modest firm of Capello and Vendramin. During this interval confusion of the coinage brought the bankers new difficulties and opportunities. By 1522 there was created a

[48] Sanuto, II, 332, 377. Malipiero (p. 531) says he was offered a loan of 30,000 ducats to tide him over and he refused, saying his debts were too great.

[49] Sanuto, III, 319, 324, 422, 423, 429, 1066.

[50] Sanuto, IV, 580.

[51] Sanuto, VII, 283, 298, 307, 722.

[52] Sanuto, VIII, 296–98.

[53] R. Fulin, "Girolamo Priuli e i suoi Diarii," *Archivio veneto*, XXII (1881), 140–43; Sanuto, XVII, 328, 354, 369, 405. Priuli was imprisoned for debt in 1517, but that was for overdrawing the state treasury (Sanuto, XXIV, 492).

situation in which the banks could continue to do business although they did not pay cash on demand. Sanuto described the banking situation in December, 1522, thus:

> . . . . These [the banks] do business by transfers on their books [*fanno facende di partide*] but there is little cash in circulation, nor do they any longer keep money in the bank as they used to do, but, after a deposit is credited [*fata la partide*], if the depositor wishes to draw his money, even if not a large sum, they send above to get it. And this is because of the great variety of coins current in this country.[54]

Again in June, 1523, he commented: ". . . . The banks are in bad shape. They do not keep money in the bank nor can one withdraw without a loss . . . . and they are banks, one may say, for transfer only [*solum di scritura*]."[55]

The slowness of the banks in paying cash was explained by the lack of good coins with which to pay. Especially scarce were good Venetian silver coins, for German silver which had formerly come to Venice to be minted and exported to the Levant went elsewhere when the pepper trade was diverted by the Portuguese. Furthermore, the market ratios between gold coins and silver coins frequently diverged from the legal ratios.[56] Difficulties over the ratios between the two precious metals were inherent in the bimetallic system. The "bank of St. George" at Genoa had given up its banking business in 1444 rather than obligate itself to maintain the gold-silver ratio at the point fixed by the state. When it resumed its general banking business more than a hundred years later at the end of the sixteenth century, it opened quite separate accounts for different coins.[57] The private bankers of Venice had met these difficulties about 1520 with the same method later used by the Venetian state bank.[58] They permitted bank money, the bank ducat, to become a unit of value and means of exchange which was distinct from any unit of coinage, and was bought and sold in the money market at a price of its own. Such a divorce be-

[54] Sanuto, XXXIII, 545–46.

[55] Sanuto, XXXIV, 237.

[56] Sanuto, XX, 155; XXXIII, 546; also Nicolo Papadopoli-Aldabrandini, *Le Monete di Venezia* (Venice, 1893–1907), I, 100–145.

[57] H. Sieveking, *Die Casa di S. Giorgio*, in *VWS Abhand. der Badischen Hochschulen*, III, 73, 200–201.

[58] Dunbar, pp. 330–32, on "ducat" of the Bancogiro.

tween the bank money and the coined money was, strictly speaking, illegal, but was made possible by the recognized shortage of good coins.

The divorce between bank money and coined money arising from the shortage of full-weight coins offered tempting but dangerous opportunities to the bankers. Since they could stall off depositors seeking cash, they could increase their loans, by writing new deposits to the credit of the borrowers, with relative impunity. Even though bank money sold at a discount the banker could hope that, by the time a shift in the international movement of specie made good coins plentiful, he would be able to pay in full. Meanwhile he could pocket the profits from his loans.

As early as 1520 the bank money had depreciated in terms of full-weight specie. Its depreciation was accounted for by Sanuto entirely in terms of the many bad coins in circulation, but one may suspect that an expansion of bank credit was partly responsible. Such an expansion is understandable in light of the large activities of the Pisani bank. Alvise Pisani was in full stride on a political career which made him one of the chiefs of the Council of Ten at forty-six, which was then considered a youthful age for such a post. He placed his bank at the service of the state to such an extent that in 1519 he had the government in his debt to the amount of 150,000 ducats. At the same time he was deeply involved in mercantile ventures.[59]

The ways in which the banker loaned to the state were various. He sent cash to the camp to pay troops,[60] furnished a letter of credit to an ambassador, drew a bill of exchange for the payment of a subsidy or tribute,[61] or met the expenses of galley commanders.[62] But Pisani had performed more than these ordinary services. Since the system of forced loans had broken down, the

[59] Sanuto, XVIII, 173, 250; XXI, 465–67; XXVI, 48, 495; XXVII, 219, 526–27. When in 1520 the Council of Ten found it necessary to reaffirm the legal ratio at which the banks must pay in gold, Pisani seemed to take it personally (Sanuto, XXIV, 414–15).

[60] Sanuto, XXI, 503.

[61] Sanuto, XXIII, 426, 563, and "lettere di cambio .... et lettere di credito .... ," XXIX, 584.

[62] Sanuto, XX, 92, 225.

Venetian Republic had been making more use of voluntary loans, and in 1516 it was provided that such a loan should be repaid in credits on the books of Pisani's bank, which thus underwrote the loan.[63]

In return for the cash he had furnished, or for the obligations to pay at a future date which he had assumed, the banker was assigned certain revenues to be paid to him as collected.[64] Most of the banker's loans to the state did not involve an immediate outlay of cash; they usually resulted merely in creation of deposits on the banker's books. The holders of these deposits would not in all cases wish at once to draw out the cash. Their deposits were probably used as were the others recorded on the banker's books. The holders of these deposits could and probably would use them to settle many of their debts, and this would frequently have no other result for the banker than a transfer of credit on his books from one account to another. There was, therefore, a reasonable chance that the credits created on the banker's books would not be drawn out until after he had collected the revenues assigned. Meanwhile the amount of bank credit circulating as a medium of exchange would have increased. Any loans to the government which the banker could manage simply by crediting additional deposits on his books would produce a certain inflation. The dominance of Pisani's bank between 1513 and 1521 would have made it easier to engineer and control such an inflation.

The situation in 1521–22 may be summarized thus: There had been a depreciation of bank money in terms of specie. Sanuto looked to the confusion of the coinage as the explanation of this depreciation. Ordinarily we would look to an expansion in the volume of the money. The evil state of the coinage really explains only the capacity of the bankers to avoid the law requiring them to pay on demand in full-weight coins. A considerable in-

[63] Text cf the decree authorizing the loan (Sanuto, XXII, 508–9).

[64] Usually the revenues assigned were not paid to the banker until after the obligation he had assumed for the state had become due. When Antonio di Priuli collected from taxes assigned him 6,000 ducats out of the 14,000 owed him for a bill of exchange on Lyons before the bill was due, he was compelled to surrender the 6,000 ducats and accept assignment on other taxes (Sanuto, XLVIII, 398, 406–8, 438).

crease in the quantity of bank money is suggested by the large credit operations of Alvise Pisani as well as by the depreciation of bank money.

The resulting situation certainly offered dangerous temptations. The immunity of the banks from the necessity of meeting their current obligations in full made banking appear a very attractive enterprise, and the number of banks increased from two to six within two years. The great merchant Nicolo Bernardo opened a bank in 1521.[65] Antonio di Priuli entered the business in 1522 to supplement, strengthen, and ultimately take over the business of his father-in-law, Alvise Pisani.[66] In June, 1523, there were three or four other firms planning to open banks, and two of these projects, those of the Molini and the Arimondi, materialized within the next year.[67]

In the midst of this sprouting of new banks came new banking laws—those of 1523, 1524, and 1526. The existent situation was thought to be dangerous and two basic changes were proposed to render the banks sound. The easiest to enforce was the change in the bonds which each banker had to post before he could enter the business. Surety could no longer be posted in government bonds.[68]

The second essential change ordered was a resumption of cash payments at the full legal rate. This was harder to enforce. The section of the law of 1523 ordering the bankers to pay in full-weight gold coins at the legal ratio remained a dead letter. Bank money continued to sell at a discount.[69] In June, 1524, a means of enforcement was provided in three bank commissioners with offices in the Rialto and with adequate clerical assistance. Every banker was required to deposit 500 ducats in the hands of the commissioners, and, if the depositor could not get his money from the banker at the legal rate, the commissioners were to pay it to him and collect from the banker so that there would always be

[65] Sanuto, XXXI, 182.

[66] Sanuto, XXXIII, 545–46. [67] Sanuto, XXXIV, 237, 283; XXXVI, 203.

[68] Lattes, pp. 81–94; Sanuto also gives the text of the laws of 1523 in XXXIV, 251; mentions that of 1524 in XXXVI, 382; and gives full lists of the bondsmen and the sums for which they were guarantors in XXXV, 467–72; XXXVI, 33–35, 348–51; LI, 83–84.

[69] Sanuto, XXXVI, 203, 355.

500 ducats for each bank in the hands of the commissioners. Eleven days after this law was passed the commissioners opened their offices and two days later they had received the deposits of 500 ducats from the Pisani, Priuli, Molin, and Arimondo banks. In the money brought by the cashier of the Pisani bank were some forbidden German coins, and that bank was accordingly fined 50 ducats. The next day the commissioners demanded the 500 ducats from Bernardo but he excused himself, saying he was liquidating. A week later he had settled with his depositors and closed his bank.[70]

Thus for a year or so the law was enforced and the banks paid without discount. But by the spring of 1526 the two retiring bank commissioners reported that bank money was at a discount of 6 per cent or more. They suggested liquidating all the banks within the next eighteen months, because they feared the demand for a renewal of the surety bonds, as required by law, would cause some to fail. It was tacitly understood that the Molin and Arimondo banks were meant. Nothing was done, however, nor were new bank commissioners elected.[71] In July bank money was at a discount of 14 per cent.[72] In October Andrea Arimondo died "from melancholia of the bank" because he could not pay.[73] On November 6 the Senate finally acted. The prohibitions against in any way selling bank money at a discount were reiterated and elaborated, the order to pay in coin reaffirmed, and, what was more to the point, bank commissioners were again elected, one for each of the four banks.[74] The feared run on the Molin bank promptly materialized and by December 5 the Molini partners had to appeal to the chiefs of the Ten to come to the Rialto and by their authority restore some order among the crush of depositors seeking funds. The Molini doubled the guaranty fund pledged by their friends. At the ducal palace their capacity ultimately to pay in full was assumed. Their obligations were only 35,000 ducats, a small sum compared to the debts of the Garzoni, Lippomani, and

[70] Sanuto, XXXVI, 382, 395, 398, 399–400, 401, 484.

[71] Sanuto, XLI, 141–42.

[72] Sanuto, XLII, 181, "especially that of Molin and Arimondo."

[73] Sanuto, XLIII, 57.

[74] Sanuto, XLIII, 173, 187–93, 232.

Pisani in 1499. On December 7 the Senate approved and so imposed a program of liquidation over the term of a year. Thus by the end of 1526 practically all the mushroom banks which had sprung up since 1521 had been liquidated without serious loss.[75]

An incidental feature of the banking law of 1526 was the prohibition of the use of checks. While checks were beginning to be used in other cities, Venice clung to the old-fashioned system requiring the depositors to appear personally at the bank when they wished to withdraw or transfer funds from their accounts. In this respect Venice was especially conservative,[76] yet, in view of the way bank deposits had developed at Venice into a form of money the value of which relative to specie rose and fell according to financial conditions, it is easy to understand the opposition of the Venetian government to the circulation of checks. Checks made easier speculations which accentuated the fluctuations of bank money.

Although Venice lagged behind other banking centers in developing the use of checks, banking practice was not stagnant at Venice. On the contrary, under the leadership of Alvise Pisani, steps were taken toward the successful use of an expansion of bank money to finance government expenditures. In the seventeenth century, through the facilities offered by the concentration of deposits in the state bank, the Banco del Giro, Venice used bank money extensively to finance war. Not only did the state then spend the specie reserve of the bank; they even paid for war expenses in bank money, i.e., by giving the sellers credits on the books of the bank. Since this bank money circulated as legal tender, the effect was much the same as if Venice had paid for war supplies with an issue of paper money. There was an inflation of the medium of exchange.[77]

Earlier, in 1499 for example, war expenses had produced a contraction of the medium of exchange. The heavy wartime issues of forced loans were accompanied by a sharp drop in the value of government bonds, a piling up of property condemned for non-

[75] Sanuto, XLIII, 376, 388, 394, 396. [76] Usher, *op. cit.*, p. 426.

[77] Guiseppe Siboni, "Il banco giro di Venezia," *Giornale degli economisti*, V (2d ser., 1892), 289–93; Dunbar, pp. 327–28, 332.

payment of taxes, and a general "tightness" of money. Specie became extremely scarce and the volume of bank money contracted sharply. This sort of a crisis had been characteristic during earlier wars: before the War of Chioggia (1378–81) government bonds had sold at 99½; toward the end of the war (March, 1381) they sold at 18.[78]

The operations of the sixteenth-century bankers, especially those of Alvise Pisani, bring us much nearer to the seventeenth-century system. The "bank ducat" was treated as a distinct monetary unit with a value different from the specie ducat. Even when not readily convertible into specie, the bank ducat continued to serve as a medium of exchange within the city. The way Pisani helped finance the government had the effect of increasing the volume of his deposits and so the volume of bank money. The effect was like that of an inflation of paper currency in that the inflated medium of exchange depreciated. Thus many features associated with the operations of the later state bank are clearly forecast in the operations of sixteenth-century private banking.

[78] Luzzato, *I prestiti*, I, cxxix and cclxxiv.

THE NEW INDUSTRIALISM IN LATIN AMERICA

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DURING the last half-century the world witnessed the remarkable rise of the Latin-American countries as producers of raw materials and foodstuffs: wool, grain, meats, and hides from the River Plate; rubber, coffee, and cacao from Brazil; sugar from Cuba and the other Antilles; henequen and chicle from Mexico; nitrates from Chile; and petroleum and the industrial metals from practically all the lands to the south of the United States. The prosperity of Latin America will doubtless long continue to depend primarily upon its agricultural, pastoral, and extractive industries, but the undisputed supremacy of the raw-materials economy has been frequently challenged in recent times. Both the World War and the great depression brought home the inconveniences and dangers arising from too exclusive dependence upon overseas countries either as markets for raw produce or as sources of supply for manufactured goods, and stimulated interest in programs designed to relieve the prevalent monoculture and to achieve a greater degree of stability. Postwar developments in Europe, particularly since 1925, such as the trend toward agrarian self-sufficiency and the policies of colonial or imperial preference, have forced a shift of emphasis from the heretofore all-important export market toward a balanced internal development. The Latin-American countries, therefore, have been caught up in the currents of economic nationalism and in the processes of general diffusion of manufacturing throughout the world.

I

Manufacturing has made rapid progress since 1930, and has now attained impressive proportions in several of the larger countries. Even prior to the onset of the depression, industrialization

had made more headway than is generally realized. One may distinguish three distinct periods of industrial advance in the Latin-American republics: first, from about 1880 to 1914; second, during the World War and the post-war period; and, third, from 1931 onward.

Manufacturing of a factory type did not take root in Hispanic America until the last quarter of the nineteenth century. Large plants established before 1880 may be considered as exceptional and experimental. The period from 1875 to 1885 was one of gradual settling-down politically and of rapid construction of railways in the four or five leading Latin-American countries. The achievement of political stability ushered in a remarkable period of economic development and prosperity, which was fertilized by an influx of immigrants and of foreign capital. The expansion of industry in the United States and Europe created a strong demand for foodstuffs and raw materials which South and Central America were well prepared to furnish. But in spite of the large profits derived from the exportation of an ever increasing volume of crude products of mines, forests, farms, and pastures, a strong desire to build up manufacturing industries persisted and found expression in official protective and promotive measures. Brazil in 1879 and 1888, Uruguay in 1888, and Chile in 1897 adopted avowedly protective policies, and most of the other Latin-American countries enacted some rates of a primarily protective character. This period also witnessed the creation in several countries of private or semiofficial societies to encourage manufacturing. The fiftieth anniversary of the Chilean Society for Industrial Promotion was observed in 1933. The Argentine Industrial Union and the Peruvian Association of Manufactures are almost as old. These associations have done much to promote technical education and to introduce modern manufacturing methods.

Many of the leading industrial establishments operating in Latin America today were founded during the period from 1895 to 1910. In Argentina the great meat-refrigerating business took its rise during this period. Several *frigoríficos* had been erected between 1882 and 1886, but shipments of frozen meat did not attain importance until after 1900. Flour milling in Argentina re-

ceived a big impetus after 1901 when the port of Buenos Aires was built and flour mills and grain elevators were erected on the land reclaimed from the River Plate. Argentina took the lead in the machine manufacture of footwear, progress being especially rapid after 1902 when an American shoe-machinery concern established a branch office in Buenos Aires.

The outstanding manufacturing developments in Brazil and Mexico during this period were in the textile field. Mexico took the lead in the beginning, but was outdistanced by Brazil about 1910. The leading present-day cotton and woolen mills were established around the turn of the century.[1] Other substantial Mexican enterprises put on foot about this time were the San Rafael paper mills, the Monterrey iron and steel works, the breweries at Orizaba and Monterrey, two important cigarette factories at Mexico City, the British-owned jute cloth and bag factory at Orizaba, and the cottonseed oil plant and soap factory at Gomez Palacio. An industrial survey made in Brazil in 1908 listed large and medium-sized plants producing leather, shoes, hats, cigarettes, beer, matches, furniture, beef extract, canned fruits and vegetables, glass, printing and wrapping paper, flour, and a variety of ironware.

In Chile a sugar-refining plant was erected at Viña del Mar in 1871, and during the last decade of the century the flour-milling industry was re-equipped with up-to-date cylinder machinery. In 1905–6 Chile passed through a stage of great prosperity, and from that date there began a considerable development of various industries. The first shoe factory with completely modern machinery was installed in Santiago in 1907, and an important cigarette factory was erected in 1909. Likewise, in Peru, the turn of the century witnessed the beginning of the factory system in the manufacture of various articles of wide popular consumption, such as cotton and woolen goods, felt hats, matches, soap and candles, leather, beer, cigars and cigarettes, and various food products. In

[1] Serious efforts to establish a modern textile industry were made in Mexico beginning as early as 1830. In 1837 an American living there was sent to the United State to procure machinery. I was informed in 1929 that one of the mills established at that time, namely, the Jauja, in the state of Tepic, was still running, with much of the original American machinery still in use.

Cuba the sugar industry was revolutionized during the years 1878 to 1898. Prior to that time sugar remained essentially a plantation product. But the need for increasing quantities of capital brought about a division of labor and the separation of the agricultural and industrial aspects of the industry. The central system, which appears to have been borrowed from the prevailing practice in Martinique, was generally adopted, and led to reduction in the total number of mills and the concentration in large units of improved mechanical and chemical efficiency. Following the revolution and the conclusion of a reciprocity treaty with the United States, a number of American companies entered the field, and large new sugar mills were erected in the eastern provinces of the island.

The rise of manufacturing in Latin America has been closely associated with the development of the abundant hydroelectric-power resources of the area. From colonial times direct water power had been used in agriculture, mining, and small-scale manufacturing operations; large water wheels still remain the motive power of a considerable number of plants situated at strategic points along the streams that rush down from the Cordilleras. The Latin-American countries are poor in coal, and it has played but a comparatively small part in the progress of their industrialization. The utilization of fuel oil as a source of industrial power did not become significant until after the World War. It was the development of hydroelectric power, and the perfection of the transmission of current for long distances, that furnished the element necessary for the successful establishment of manufacturing of the factory type. The first machinery completely operated by electricity was installed in Mexico in 1893 at the Santa Ana mines in San Luis Potosi. Two years later the San Ildefonso woolen mills were electrified. By 1899 the leading cotton mills were either generating their own hydroelectric power or were purchasing the surplus of other mills. The Canadian interests that have taken a leading part in the development of Mexican and Brazilian water-power resources entered those countries between 1899 and 1905. A Brazilian industrial survey made in 1908 showed that most of the large factories bought their power from the local subsidiary of

the Canadian company. Argentina, being poor in water-power resources, relied primarily on steam generated from imported coal, but the availability of cheap electric power derived from waterfalls near Cordoba determined the location of a number of shoe factories in that city. The use of electric power in sugar mills (with bagasse as fuel) began around 1911, being employed at first to drive the pumps and auxiliary machinery. The Central Amistad sugar mill at Guines, Cuba (installations being placed in operation in December, 1913) was the first example of a completely electrified sugar mill. The scene was now prepared for the next important stage of manufacturing advance, which embraces the war and post-war periods.

The World War gave a profound impetus to manufacturing in all the larger countries. On the one hand, there was a great demand in the belligerent countries for foodstuffs, which gave rise to many new food-processing plants. For example, branches of American packing houses were established in Brazil and Uruguay at that time. On the other hand, owing to the shortage of shipping and the export restrictions of the allied governments, the Latin-American countries were unable to obtain many kinds of manufactured goods which they were accustomed to import, and were therefore forced to produce them at home or forego their use. Some of the new establishments set up during the emergency were unable to survive the severe competition and "dumping" of the post-war era, but not a few took root and are still flourishing. The war also left a heritage of stronger nationalistic sentiment and a desire for a greater degree of self-sufficiency. Countries like Argentina, which had previously been engrossed in the ample profits derived from exports of agricultural and pastoral products, began to turn their eyes toward manufacturing as an alternative source of income. In 1924 a leading Argentine economist declared that this was the last generation of importers and ranchers (*estancieros*) and that the next generation would consist of farmers (*granjeros*) and manufacturers.[2]

The depression of the 1930's, like the war period, further stimulated the tendency toward greater self-sufficiency. The catas-

[2] Alejandro E. Bunge, *La economía argentina* (Buenos Aires, 1928).

trophic decline in the returns derived from exports forced a drastic reduction in imports. The depreciation of currencies increased the cost of foreign goods, and the exchange-control measures introduced in half of the Latin-American countries have been operated in a manner to favor importation of raw materials and necessities but to exclude finished goods. Looking beyond the emergency to the future, the Latin-American governments have decided that, in view of the trend toward agrarian self-sufficiency in Europe, they would have to produce themselves some of the manufactured articles formerly obtained in exchange for raw materials. In the case of Chile the development of synthetic nitrates and the opening-up of new and richer copper deposits in other parts of the world have fundamentally altered the bases of its economy and forced a shift of emphasis.

II

From this brief historical sketch I now turn to a statistical analysis of the present position of manufacturing in Latin America. The latest available statistical data regarding the status of manufacturing in the principal Latin-American countries are given in Table 1. Questionnaires for a new industrial census in Argentina were sent out on October 31, 1935, but the returns have not yet been published. The second industrial census of Mexico was taken on April 10, 1935, but the returns are incomplete. Although figures for five countries are set side by side in this table, it should be kept in mind that they are only roughly comparable, since they have not necessarily been compiled on the same bases. There is no hard-and-fast line of demarcation between household and factory industries, and it is not always easy to distinguish between extractive industries on the one hand and manufacturing on the other.

Miners and railway and public-utility employees have been excluded from this table, but for some purposes a truer picture of the situation would be obtained by including them. In Mexico, in 1933, there were employed 75,000 persons in mining, 63,000 on the railways, 5,000 on the tramways, and 13,300 in electric light and power companies. The figures for Brazil were: 23,000 in mining,

117,000 on the railways, 21,000 on the tramways, and 16,000 in electric light and power companies.

In the absence of data showing the "value added by manufacture" for all the five countries listed in Table 1, the "gross value" has been shown, although it is recognized that the latter figure is an unsatisfactory index. Apparently the gross value would include the full dealer price of the motorcars turned out by an auto-

TABLE 1

STATUS OF MANUFACTURING IN LEADING LATIN-AMERICAN COUNTRIES, ABOUT 1933

Country	Total Population	Persons Engaged in Manufacturing	Gross Value of Manufactured Products (Millions)	Equivalent in Dollars at Average Quoted Exchange Rates in 1933 (Millions)¶
Argentina*	12,015,000	389,066	2,642 pesos	845
Brazil†	41,478,000	510,000	6,750 milreis	540
Chile‡	4,287,000	225,820	1,500 pesos	120
Peru§	5,500,000	18,666	175 soles	33
Mexico‖	16,552,000	305,402	832 pesos	233

* Based on *Comments on Argentine Trade*, official organ of the Chamber of Commerce of the United States of America in the Argentine Republic (issue of January, 1934), pp. 38–39.

† Based on *Brazil 1933*, issued by the Brazilian Ministry of Foreign Affairs (Rio de Janeiro, 1933), p. 186.

‡ Based on *Sinopsis geográfico-estadística de la república de Chile 1933*, issued by the Dirección General de Estadística (Santiago, 1933), pp. 39, 109, 181, 215, 256, and 259; also *Censo de la industria manufacturera y del comercio de 1928* (Santiago de Chile, no date), pp. 54–55.

§ Based on Ministerio de Fomento, *Las industrias en el Perú 1936*, Boletín del Cuerpo de Ingenieros de Minas del Perú, No. 114 (Lima, 1936), p. xvi.

‖ Based on *Primer censo industrial de 1930*, issued by Secretaría de la Economía Nacional, Dirección General de Estadística (Mexico City, 1933). Data relative to light and power companies, which were included in original tables, have been eliminated.

¶ Owing to exchange control in Argentina, Brazil, and Chile in 1933, the quoted exchange rates were partly nominal.

mobile assembly plant, for example, even though all the assembly parts are imported, and likewise would include the wholesale price of pharmaceuticals which are only packaged in the country by branch plants of foreign concerns. Only in the case of one country do the official returns show the value of the raw materials used in manufacturing, but fairly reliable estimates are available for some of the other countries.

The Mexican industrial census of 1930 placed the value of raw materials used in manufacturing at 314 million pesos. Subtract-

ing this amount from the gross value of manufactures produced, the resulting sum of 565 million pesos may be considered as corresponding to the "value added by manufacture." Some indication of the relative importance of manufacturing in the national economy of Mexico may be obtained by comparing this figure with the average annual value of all crops during the period 1928–30, which is placed at 520 million pesos.[3]

In Argentina Dr. Bunge has recently estimated that the value added by manufacturing in 1933 amounted to 2,062 million pesos, out of a total value of Argentine national physical production in that year of 4,383 millions, or 47 per cent.[4] The Brazilian statistics show only what appears to be the gross value of manufactures, and particulars are lacking as to the manner in which the estimates are compiled. It may be noted that the gross value of Brazilian manufactures in 1933 and 1934 was approximately equal to the aggregate value of all agricultural products in those years.[5] In Peru it is estimated that not less than 35 or 40 per cent of the total requirements of the country are supplied by domestic manufacture. The value added by manufacturing, after deducting the cost of raw materials used in the various industries, is calculated as roughly half of the gross value of manufactures.[6]

III

As the Latin-American countries are still in the early stages of industrialization, the principal manufactures are of a type involving relatively simple processes. Typical examples are: the preparation of foodstuffs—meats, dairy products, sugar, flour, paste foods—and beverages; animal by-products; articles having a wide popular market, including cotton cloth, knit goods, shoes, hats, furniture, paper, printing, pottery, glassware, pharmaceuti-

[3] *México económico 1928–1930*, issued by National Railways of Mexico (Mexico, D.F., 1932).

[4] Alejandro E. Bunge, "Present Economic Situation in the Argentine," *Revista de economía argentina*, XVIII, Nos. 208–10 (October–December, 1935), 300.

[5] *Brazil 1933*, issued by the Brazilian Ministry for Foreign Affairs (Rio de Janeiro, 1933), pp. 29 and 187; also *Brazil 1935*, p. 41, and *Boletim do Ministerio do Trabalho, Industria e Commercio*, March, 1936 (table on back cover).

[6] U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, Special Circular No. 324, *Manufacturing in Peru* (November 21, 1934), p. 1.

cals, soap, and ironware; and bulky products of relatively small value, such as building materials, which are naturally protected by the high freight costs involved in bringing them in from abroad.

If we adopt the number of workers engaged in an industry as the best criterion of its importance, we find that either textiles (including clothing) or foodstuffs generally constitutes the dominant group. The official Brazilian statistics definitely establish the textile group as the principal one, with foodstuffs in fifth place, following the wood, leather, and metal industries. In Argentina the foodstuffs group—including meat packing, dairying, flour milling, wine and sugar making and brewing—is clearly in the forefront, with textiles in second place. The two groups are of co-ordinate importance in Mexico and Peru. The forest-products industries—embracing lumber, furniture, mill products, and paper—likewise constitute an important classification, except in Argentina, which imports the larger portion of its lumber requirements. Thus up to the present time the occupational distribution in the Latin-American countries tends to conform to that stage of development which Professor Usher has characterized as "the intermediate industrial order."[7] The leather-working group, however, is somewhat less important, and the metal-working group rather more developed, than might be expected in comparison with the situation that prevailed in Northern Europe around the middle of the nineteenth century.[8] The relatively smaller place occupied by leather working in Latin America may partly be accounted for on climatic and historic grounds, since a considerable proportion of the native Indian classes have never known the luxury of shoes or boots. Now that the use of footwear is rapidly gaining ground, rubber-soled canvas shoes and *alpargatas* (Spanish-type rope-soled shoes) are widely worn among the rural and laboring classes. Even the crude *guaraches*, or sandals, are made to a large extent from discarded tires. Workers in metal industries (excepting the mining, smelting, and refining of minerals) constitute 9 per cent of all industrial workers in Mexico, 12 per cent in Brazil, and 14 per cent in Argentina.

[7] Abbott Payson Usher, *The Industrial History of England* (Boston, 1920), p. 256.

[8] *Ibid.*, p. 257 (tables).

Heavy industries are the exception rather than the rule. In fact, it is generally recognized that the most seriously limiting factors affecting the further industrialization of Latin America are the lack of good coking coal and the difficulty of working the known iron deposits. Brazil, Mexico, Chile, and Venezuela are considered to have the necessary iron resources; but none of these countries produces an entirely satisfactory quality of coking coal. The absence of these resources in convenient juxtaposition will impose a severe handicap on the development of a large-scale industrialism in Latin America comparable to the classical coal-and-iron industrialism of Great Britain, Belgium, the United States, Germany, and France. Several of the Latin-American countries have entertained the hope of building up a great iron and steel industry, but little progress has been made in spite of the generous assistance afforded by the various governments. Mexico has the famous "Iron Mountain," said to contain 300,000,000 tons of iron, and also less important deposits in other states. An iron and steel mill, established at Monterrey with the assistance of American experts and the participation of some American capital, began production of pig iron, steel, and rolled products in 1903, and has continued until the present time with a small but steady increase in the volume of output and the variety of products. The Monterrey company is the only one in Mexico producing pig iron from ore mined in its own mines, but the American-owned foundry and rolling mill at Mexico City is a substantial and profitable enterprise. Mexico, like several other Latin-American countries, imposes a heavy export duty on scrap iron for the benefit of its iron and steel industry.

Brazil is said to contain the most extensive undeveloped deposits of iron ore of any country of the world, and also possesses deposits of manganese ore equal to those of any other country.[9] Brazil has made serious efforts to establish an iron industry, and since 1918 has adopted a series of measures designed to help the iron and steel manufacturers financially. The plant at Ribeirão Preto, equipped with electric furnaces, was erected by Brazilian

[9] Benjamin L. Miller and Joseph T. Singewald, *The Mineral Deposits of South America* (New York, 1919), pp. 166 and 192.

capitalists, and a blast furnace was erected with Belgian capital. In 1924 a law granting more generous subsidies was passed, and several new mills were established. Only the two principal companies were in operation at the end of 1935, but the output of pig iron, steel, and rolled products has more than doubled since 1931, and further expansion was anticipated at that time. The Belgian company began in 1935 extensive additions to its plant capacity, and there is a general feeling in trade circles that the foundations have been laid for a substantial iron and steel industry. Argentina does not produce coal or iron ore in commercial quantities, but a considerable secondary industry, using scrap and imported pig, or imported sheets, bars, and plates, has arisen.

Some students of the problem, who have emphasized the handicaps imposed by the shortage of coal and workable iron deposits,[10] appear to have made inadequate allowance for the possibility of a new type of industrialism, based upon the new technology and the utilization of new power sources, such as fuel oil and hydroelectric power. Data compiled for the World Power Conference of 1929 indicated that, while Latin America possesses less than 1 per cent of the world's coal resources, this area produced about 16 per cent of the world's petroleum. The Conference estimated that Latin America has approximately 15 per cent of the world's water-power resources. The water-power resources of South America alone are considered greater than those of all Europe, and about the same as those of North America.

Latin America's deficiency in coal and iron imposes limitations on the military power of the Latin-American nations, and consequently to some extent on the position of such countries from the standpoint of international relations. The possession of coal and iron, as well as of other "key" commodities, assumes importance from the standpoint of "the control of the power materials for peace and war."[11] Some have drawn the conclusion from this cir-

[10] E.g., H. Foster Bain and Thomas Thornton Read, *Ores and Industry in South America*, published by the Council on Foreign Relations, Inc. (New York and London, 1934) and Frank Tannenbaum, *Whither Latin America?* (New York, 1934).

[11] H. Foster Bain, "World Mineral Production and Control," *Foreign Affairs*, XI (July, 1933), 707.

cumstance that "such influence as Latin America is destined to exert in the world will be more in the moral and intellectual spheres than in the economic, or in that section of the political field which rests upon the politics of power."[12]

It is not impossible that the advantages possessed by Latin America in petroleum and hydroelectric resources may eventually offset the deficiency of that area in high-quality coal. Even the older industrial nations, like Great Britain, are turning to electric power as the most convenient and efficient form for industrial propulsion, although the current is generated by coal consumption.

It may be questioned whether a shortage of iron is necessarily more serious than a shortage of foodstuffs or industrial raw materials, such as fibers. It may be argued that dependence upon imports of foodstuffs is really more serious, especially in war time, as iron or scrap can be stored to better advantage than food. Furthermore, fuel oil is now generally preferred to coal by the navies of the world. Commercially, the relative disadvantages involved in dependence upon one or the other type of import turn upon questions of transportation charges and other factors which vary in different industries. It has also been generally overlooked that many of the world's greatest industries, such as the British cotton industry—the cornerstone of the Industrial Revolution—and also the Japanese textile industry, which in 1933 surpassed the British after the latter had maintained its world-supremacy for a century and a half, have relied entirely on imports of the principal raw material required. The fact that the United States produces practically no crude rubber or tin has not prevented this country from becoming the largest manufacturer of tires and mechanical rubber goods, or the leading consumer of canned food products.

In the new twentieth-century industrialism chemistry (along with fuel oil and hydroelectric power) is one of the main pillars, just as coal and iron were the foundations of the older Industrial Revolution. Recent developments in the chemical trades in Latin America are therefore of especial significance. In 1935 strong British and American interests joined in the formation of an Ar-

[12] Foreword by Dr. James T. Shotwell to Tannenbaum, *op. cit.*

gentine stock company designed to supply most of the chemical needs of that country. This combine has started construction of a viscose rayon plant at Buenos Aires, while a French-owned plant, producing acetate cellulose, began operations last year. There are now two plants in Brazil producing rayon yarn, and a third, moved bodily from Virginia, will have an annual capacity when completed of about 3,000,000 kilos. The production of alkalies has also begun in Brazil and Chile, and the possibilities are being investigated in Argentina, Mexico, and other countries. The production of acids, calcium carbide, alcohol, vegetable oils, and pharmaceutical products has expanded considerably in recent years. Latin America will doubtless be under some handicap in the production of a long array of chemical, dye, and pharmaceutical products which are based on the by-products of coal distillation, but this shortcoming may be largely overcome by the advantages derived from abundant supplies of petroleum, which also has wide uses in this field, by hydroelectric resources which are fundamental in certain metal and chemical industries, by the fact that coal can be purchased at cheap rates as a result of the fact that it is usually shipped out from Europe as ballast, and also by the possibility of new developments in technology which may change present productive methods.

IV

The major portion of Latin-American manufacturing activity is confined to the simpler processes—the assembling of imported parts or the production of the coarser grades of articles for general consumption. But industry is showing signs of greater maturity in several of the larger countries. Leading manufacturing enterprises, assisted by the state, are seeking out native raw materials, and are tending to extend their operations to include all, or most, stages of the manufacturing process. The textile, the radio-receiver, and the automotive industries furnish striking illustrations of this tendency. In most of the Latin-American countries weaving was the first of the textile processes to go over to machine methods, although both Brazil and Mexico had substantial spinning and weaving industries before the World War. Argentina had a

small woolen industry and did some weaving of cheap cotton cloth; but the real development of the Argentine textile industry has come only within recent years. Argentine mills are now estimated to supply 80 per cent of the country's requirements of woolen goods, practically all the coarser counts of cotton yarn, a third of the cotton cloth, and the major portion of the rayon goods consumed in the country. Heretofore, the rayon industry has used imported yarn, but mills recently completed or in the process of erection will supply most of the domestic requirements. All the larger countries are practically self-sufficient in knit goods, except in de luxe specialties.

Starting with the assembling of imported parts, the radio-receiver industry has now expanded in several countries to include local manufacture of most of the cabinets and varying proportions of the transformers, condensers, tubes, etc. Automobile assembling was begun in Argentina during the World War, in Brazil in 1920, and in Mexico in 1926. Now most of the truck and bus bodies are built locally, and domestic manufacturers supply the bulk of the demand for many kinds of parts and accessories. There are both locally owned plants and foreign branch factories in these countries manufacturing incandescent lamps; and the assembling of refrigerators and other electric installations and appliances is approaching the complete manufacturing stage. The rubber manufacturing industries of these countries have expanded rapidly, and are now supplying the bulk of the local requirements for casings and inner tubes, rubber-soled canvas shoes, rubber heels, and many types of mechanical rubber goods. There is some manufacture of machinery.

The Latin-American countries are fairly well provided with industrial raw materials. They possess a variety of metals and building material, hides, vegetable and mineral oils and essences, and the principal fibers, such as cotton, wool, alpaca, and the hard fibers. Jute, however, is not produced in commercial quantities, and the great flax crop of Argentina is of the oil-producing rather than of the fibrous type. The Brazilian government in 1934 extended tax exemptions and other facilities to new industries using native raw materials, and other governments have made adjust-

ments in customs duties and internal taxes designed to encourage the utilization of national products.

The progress of machine methods varies widely as between countries and as between industries within the same country. In Latin America one becomes accustomed to great contrasts in production methods, as well as in living conditions and social types: the stands of the sandal-makers continue to flourish alongside modern shoe factories, and hand spinning and weaving still go on in the shadow of the great textile mills. Some of the countries are veritable sociological museums, and exhibit all stages of development ranging from primitive man up through an advanced stage of international economic affiliations. A considerable but varying proportion of the population in those countries has but little contact with money economy, and in none is the financial and credit structure very highly advanced. Household industry still exists in a thriving way. It furnishes a large percentage of woolen articles—such as *serapes*, which serve as a cloak by day and a blanket by night—pottery, shoes and sandals, straw hats, baskets, mats, and wooden articles. These goods, made in the homes, are carried to town on market days by members of the family. Owing to the prevalence of public markets and the lack of important foreign outlets for articles which lend themselves to household methods, the putting-out system has never attained the relative importance that it has held, or still holds, in other parts of the world. It is found, however, in the shoe and clothing trades. In certain sections of Guatemala the outer cotton garments of the Indians (the latter constitute some 80 per cent of the total population of the country) are still woven in each family unit. But the workers on the coffee *fincas*, who have been incorporated into a money economy, generally use factory-made sheeting, and the laborers at the banana ports are likely to be fitted out with imported denims or suitings. To a much greater extent than in the United States, the well-to-do and even persons of moderate means prefer custom tailors and shoemakers for their clothes and footwear, but ready-made articles are gaining in popularity.

The efficiency of organization and equipment also varies greatly in Latin-American industries. The average is probably consid-

erably below that in some other recently industrialized regions such as Japan. Some of the foreign-owned branch factories are up to date in every particular, and very efficient units are also to be found among locally owned enterprises. In the past many industries have operated on a concession or virtually monopolistic basis, foreign competition was excluded by high tariff protection or by complete embargoes, capital was scarce, risks were great, and there was little incentive to improvement in methods. While there has been no change in the disposition of the various governments to accord ample protection to national industries, in recent years there has developed an increasing solicitude regarding the price level, and a desire to bring a larger range of manufactured goods within the scope of the purchasing power of the rural elements who have heretofore consumed little other than the handicraft articles of their own manufacture. Mexico, for example, in 1933 and 1934 reduced the rates of duty on some manufactured articles for the purpose of bringing down retail prices, and at the same time put into effect a more active policy of controlling prices of necessaries, including electric current, gasoline, charcoal, and medicines.

V

Manufacturing has already made such headway in several Latin-American countries that there can no longer be any doubt as to its substantial possibilities. But it must be recognized that further significant achievements are subject to limitations. There is the shortage of iron ore and coal. Other conditioning factors are the sparse population and low per capita purchasing power; various psychological and historical characteristics of the population reflected in their preference for landowning, politics, and the professions, rather than for commerce and industry; and the relative shortage of capital. However, these factors have in part been counterbalanced by various new forces: the increase of population, efforts to improve the standard of living of the masses, the growth of national sentiment and of business spirit, and the revolutionary technological changes profoundly affecting the bases of industrialism.

There has been a traditional aversion to business among the educated and well-to-do classes in Latin America. This partly explains the fact that the development of natural resources in the southern continent has been largely executed by foreigners. Since the war, however, there has been a decided change. Technical education is being emphasized; and thousands of young Latin Americans have received technological instruction either in the United States or at home in the factories of foreign-owned enterprises. The railways prepared the way for industrialism not only by opening up new markets but by serving as training schools for mechanics, clerks, and accountants. The coming of the motorcar has been an even more potent factor, as thousands of young Latin Americans have obtained their first lessons in mechanics under the necessity of tinkering with a stalled motor or repairing a punctured tire. Tendencies in the same direction are the development of aviation, the increasing mechanization of plantations and farm co-operatives, and the greater use of electrical and mechanical devices in the home.

That ample capital is likely to be forthcoming when other circumstances are propitious for the establishment of new industries has been demonstrated by the experience of recent years. Some of the new capital derives from foreign sources, but larger amounts come from local sources. The operation of exchange control has in some instances forced the return of profits from exports which otherwise might have been spent abroad. Monetary uncertainties in the United States and Europe have induced the repatriation of funds and local reinvestment of the dividends or surpluses of foreign-owned enterprises.

The role of foreign capital opens up an interesting chapter of economic history that can only be touched upon here. It has been less significant in the advance of manufacturing than in the development of the extractive industries, railways, and public utilities. True, some of the outstanding manufacturing enterprises are branches of foreign, particularly American, concerns—packing houses; plants for assembling automobiles and radio-receivers; cigarette, chemical, and tire factories; and establishments for

compounding and packaging pharmaceutical products.[13] Since 1933 a cotton textile factory has migrated from New England to Buenos Aires; a Virginia rayon factory is being reinstalled in Brazil; and recently American companies have installed cotton gins and cottonseed oil mills in Brazil and Argentina. But of greater significance than the direct investment of foreign capital is the activity of immigrants and foreign residents in building up manufacturing enterprises out of small nest eggs which the new arrivals may have brought with them but in most cases accumulated in the country itself. Many textile mills, breweries, cigarette factories, tanneries and shoe factories, flour mills, and biscuit and spaghetti factories, for example, are still in the hands of the French, Scotch, Italian, Irish, or German settlers who originally founded them or of their descendants. In Mexico many of the leading cotton mills, as well as drygoods and department stores, are owned by a small group of Frenchmen most of whom came from the Department of Basses Alpes. These Frenchmen are known as the "Barcelonetas," their original home being in the vicinity of Barcelonnette. The first of these French settlers arrived in 1821 and subsequently brought over their relatives and friends. Swiss and German immigrants, including skilled artisans, began to arrive in considerable numbers about the middle of the last century. This element is particularly important in Southern Chile and in the state of Rio Grande do Sul in Brazil. Francisco Matarazzo, the leading industrialist of São Paulo and perhaps of all South America, is of Italian origin and had the title of "Count" bestowed upon him by the Italian government in recognition of his services during the World War; but he is now considered "irremediably Brazilian."[14]

[13] The latest study of the branch factory movement in South America is that by Professor Dudley Maynard Phelps, *The Migration of Industry to South America* (New York, 1936). The following should also be consulted: Senate document No. 258, 71st Congress, 3d session, *American branch factories abroad*, and Senate document No. 120, 73d Congress, 2d session, *American branch factories abroad*.

[14] Count Matarazzo died on February 10, 1937, at São Paulo. In spite of his eighty-odd years, the Count was active to the time of his death in directing the numerous factories, banks, steamship lines, and trading organizations under his control.

The Latin-American countries may be expected to continue to draw upon foreign countries for capital, for machinery, and for management and technical assistance. But with the "coming of age" of the larger Latin-American countries, the state is endeavoring to subordinate foreign influence to national objectives and to bring about the substitution of native technologists and executives in the lucrative positions heretofore held principally by foreigners. Most of the Latin-American governments have laws requiring a definite percentage, ranging from 50 to 90, of the personnel of local enterprises to be nationals of the country. In Mexico the only foreigners who are allowed to accept employment are experts not otherwise available in the country. The employer of a foreigner must agree in each case to train one or more Mexicans at his own expense so that they may take over the work when qualified. The new Brazilian constitution of 1934 requires that in all concessionary enterprises the majority of the board of directors must be Brazilians. The Argentine government has in the past been very liberal in its attitude toward foreign investors. But it is now tending to build up its own petroleum industry, to extend the state-owned railway lines in competition with the established British companies, and to create the nucleus of an Argentine-owned meat-packing industry. The increase of economic nationalism and governmental intervention also tends to reduce the relative importance of foreign enterprise in economic life.

As regards labor, the almost unanimous testimony of foreign mining, railway, and manufacturing executives is that Mexican and South American workers show a decided aptitude for mechanical or factory operations. To cite two illustrations from my personal experience, the representative of a leading firearms concern informed me in 1927 that Mexican soldiers chosen at random learned to mount machine guns more quickly than the average European soldier. An American electrical engineer with experience in both Japan and Latin America expressed the opinion that Latin Americans have more natural mechanical talent than the Japanese.

Owing to the rapid development of manufacturing in Argentina and Brazil in recent years, a shortage of skilled workers has at

times been reported. But this shortage is being overcome by technical training provided both at home and abroad. It is now the practice of various American corporations operating branch factories in Latin America to send their most promising local employees to the United States for technical training. American-owned aviation companies operating in Latin America are training native pilots and mechanics. Beginning about 1927, the Mexican government made arrangements whereby selected graduates of Mexican technical schools received practical experience in the United States and in Mexican plants of large American companies. Unemployed factory workers in the United States and Europe constitute a large reserve from which the Latin-American countries can draw; but the present tendency is for these governments to follow a more selective policy as regards immigration and to reserve employment opportunities to their own nationals.

It may well be that the advance of manufacturing will at times be interrupted whenever the export market for Latin-American products becomes sufficiently attractive, since a higher rate of return for agriculture and the extractive industries would engender competition for the available supply of labor, capital, and business ability.

The lack of a real national market in some of the leading countries is still a factor retarding industrial progress. Brazil, for example, is broken by natural barriers into a series of regional markets. The northern states have no rail connection with either the capital or the principal industrial centers; and factories as a rule produce only for the region in which they are located. Similar conditions prevail in such important countries as Mexico and Colombia, although determined efforts are being made to improve transportation facilities with isolated regions. The Mexican six-year plan, launched in 1934, calls for an expenditure of 60,000,000 pesos for the extension of the railway net to outlying regions; highway construction is also being actively pushed; special freight rates have been introduced by the national railways to enable domestic manufacturers to compete with foreign goods in remote sections; and the schools and government agencies are being used

to promote the sale of national products in all parts of the country.

But some of the Latin-American countries are looking abroad for outlets without waiting to complete the conquest of the domestic market. Chile has adopted an aggressive policy of promoting manufactured exports through reciprocal agreements of a preferential character with other South American countries. American glassware has been largely supplanted in Peru by Chilean glassware and bottles, which enjoy special treatment in the Peruvian market. Imports of Chilean canned goods are also favored by the commercial treaty between Chile and Peru. A trade agreement signed between Chile and Ecuador in April, 1936, providing for mutual customs concessions, was expected to lead to increased purchases by Ecuador of Chilean wheat, flour, lard, canned goods, patent leather, milk products, and possibly pharmaceutical specialties and insecticides. Mexico has shown a special interest in the Central-American market since 1933, and has succeeded in selling respectable quantities of bottles, knit goods, leather, and matches. Some Mexican manufactured products, principally binder twine and shoes, find a market in the United States. Other examples of similar nature might be cited, but, in spite of these modest beginnings, it appears unlikely that Latin America will become an important exporter of manufactured goods within the near future. Nevertheless, it would be unwise to rule out the possibility that the exportation of some articles might become a significant factor in world-trade. Since the war a number of leading American manufacturers have established assembly or manufacturing plants in Latin-American countries to accommodate themselves to the tariff policies of those countries. These concerns are in a position to take advantage of any favorable freight rates or preferential treaty arrangements that may now exist, or that may in the future be concluded, between neighboring Latin-American states. Precedents for this policy already exist in the branch plants established by American manufacturers in Canada and Europe. Branch factories in Canada obtain the benefit of preferential tariff rates within parts of the British Enpire. Branch fac-

tories in Europe are sometimes able to compete in other European (or even non-European) markets to better advantage than the home plant in the United States. Japanese interests have also at various times in recent years been reported as investigating the possibility of establishing manufacturing centers at free ports in Latin America.

It is necessary to guard against hasty generalizations about Latin America as a whole, for they tend to obscure the profound differences which exist between the various countries. It is also necessary to avoid conclusions based upon easy analogy with conditions in the United States and Europe. The rapidity and extent of further industrialization are conditioned by a complex of racial, historical, climatic, and geographic factors which will produce great variations within the area. A few regions are on the threshold of a very considerable industrialization, while others may be passed by entirely. There is no reason to assume that the pattern of the old Industrial Revolution will be followed in all respects or that the rhythm of development will be the same throughout the Western Hemisphere.

THE ECONOMICS OF CARL MENGER

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FOR a long generation Carl Menger has been in Anglo-Saxon countries a famous but seldom read economist. Historians of economic thought always give to him at least honorable mention as the man who, with Jevons and Walras, rediscovered and popularized the theory of subjective value. But the barriers of inaccessibility and language have served effectively to hide all but the barest outlines of his work from the bulk of English-speaking students of economics. None of Menger's writings has been translated, and his *magnum opus*, *Grundsätze der Volkswirtschaftslehre* (1871), has long been out of print. Menger's fame, in fact, has been largely a reflection of the achievements of his foremost disciples, Wieser and Böhm-Bawerk. This is a serious injustice; in important respects his theoretical structure was superior to that of his followers. Accordingly the London School of Economics deserves especial gratitude for having removed the barrier of inaccessibility, although not that of language, by fittingly closing its valuable series of "Reprints of Scarce Tracts" with his collected works.[1]

Menger's writings fall within three rather clearly defined fields: economic theory, methodology, and currency. The present essay is concerned only with his economic theory, which, with the exception of the long article, "Zur Theorie des Kapitals" (1888, in Vol. III of the reprint), is presented in the *Grundsätze*.[2] Full bio-

[1] Vol. I (Reprint No. 17): *Grundsätze der Volkswirtschaftslehre* (1871); Vol. II (Reprint No. 18): *Untersuchungen über die Methode der Sozialwissenschaften* (1883); Vol. III (Reprint No. 19): *Kleinere Schriften zur Methode und Geschichte der Volkswirtschaftslehre;* Vol. IV (Reprint No. 20): *Schriften über Geldtheorie und Währungspolitik.*

[2] The methodological writings are in Vols. II and III; chap. viii of the *Grundsätze* and Vol. IV are on currency. All page references in the present essay will be to the *Grundsätze* (Vol. I) unless otherwise noted.

graphical details of Menger's life and an excellent discussion of his intellectual milieu are already available, and need not be repeated here.[3]

It will be interesting to begin by comparing Menger with Jevons, who published his *Theory of Political Economy* in the same year (1871) in which the *Grundsätze* appeared. Several parallels can be drawn between the two men. Each was, in contrast with Walras, essentially non-mathematical in method; each wrote on certain parts of economic theory but intended eventually to write a comprehensive treatise which never appeared;[4] each was in sharp revolt against the classical political economy. But Menger's theory was greatly superior to that of Jevons: It was systematic and profound; it avoided the clumsy and unnecessary use of mathematics; and in particular it generalized value theory to include a sound general theory of distribution.

The two men differed greatly in their influence on contemporary economic thought. Jevons had virtually no direct followers.[5] A strongly intrenched classical school, his repellent mathematics,[6] and the lacunae in his theoretical structure explain in part the fact that no "Jevonian" school emerged.

Menger was more fortunate. In his steps followed a group of able economists who, adhering closely to his general approach and frequently accepting even details and terminology of the *Grund-*

[3] Consult F. A. von Hayek's Introduction to Vol. I for a general outline of Menger's life and work; his intellectual environment is finely treated by J. Schumpeter, "Carl Menger," *Zeitschrift für Volkswirtschaft und Politik* (N.F.), I (1921), 197–205.

[4] Jevon's fragmentary *Principles of Economics*, which was published posthumously (1905), is well known; Menger added *erster, allgemeiner Teil* to the title-page of his first edition, very much as Marshall did twenty years later. Menger projected three additional parts to deal, respectively, with distribution, money, and credit; production and commerce; and general economic policy. Cf. Introduction to second edition (1923), p. vi. This second, posthumous edition was edited by Karl Menger, his son. It will not be considered here; cf. F. X. Weisz, "Zur zweiten Auflage von Carl Mengers 'Grundsätzen,'" *Zeitschrift für Volkswirtschaft und Politik* (N.F.), IV (1924), 134–54.

[5] Wicksteed, the important exception, published his general, non-mathematical work, *The Common Sense of Political Economy*, only in 1910.

[6] Thus Cairnes referred to his "abstruse mathematical symbols" (*Leading Principles*, p. 21 and note).

sätze, developed into the so-called "Austrian" school. Wieser and Böhm-Bawerk were outstanding among the nineteenth-century followers, but there were many others—among them Sax, Komorzynski, Mataja, Gross, and Meyer. Menger's success is clear in the light of Jevons' failure. The former faced no established theoretical tradition—what little theoretical German economics there was at the time possessed a strong anticlassical bias; Menger's treatment was lucid, systematic, and comprehensive; and, to mention a factor of ambiguous importance, his was good economic theory.

It is convenient to treat Menger's theory under four heads: "The Theory of Subjective Value," "Productive Organization: The Allocation of Resources," "The Theory of Imputation," and "The Distributive Shares: Classical Theory."

THE THEORY OF SUBJECTIVE VALUE

A thing secures *Güterqualität* (the quality of being a good), begins Menger, from the simultaneous fulfilment of four conditions (p. 3): (1) There must be a human want. (2) The thing must possess such properties as will satisfy this want. (3) Man must recognize this want-satisfying power of the thing. (4) Man must have such disposal over the thing that it can be used to satisfy the want. Things which fulfil the first two conditions are "useful things" (*Nützlichkeiten*); those fulfilling all four requirements are "goods" (*Güter*). The absence or loss of any one of these four conditions is sufficient to entail loss of a thing's *Güterqualität*. The last two of Menger's conditions are merely formal; the economic significance of the others deserves elaboration.

Human wants need not be rational; cosmetics(!) equally with food possess *Güterqualität* (pp. 4–5)—although Menger is optimistic enough to believe that irrational wants become less important as civilization progresses. Similarly, if the belief that a thing possesses want-satisfying power is mistaken (e.g., quack medicines), that again does not affect its *Güterqualität*. And, finally, the word "thing" is purposely vague: Menger argues strenuously that useful human activities, as well as useful material goods, belong in the category of goods (pp. 5–7).

This emphasis upon non-material goods—which is properly extended to include such things as monopolies, good-will, and patents (pp. 6–7)—is a genuine though neglected contribution to economic thought. Classical theory restricted economic analysis primarily to material goods (e.g., "productive" vs. "unproductive" labor), and this practice served—and still serves—to obscure some of the most fundamental concepts of economics, such as income, production, and capital. Menger follows the classicists, however, in failing to distinguish between *goods* and *services from goods*, as we shall presently see.

Menger immediately forestalls an obvious question: Do productive resources, which cannot be consumed directly, lack *Güterqualität?* Clearly not, for, although they cannot satisfy wants directly, they can be transformed into want-satisfying goods, and indeed most of man's economic activity is concerned with this transformation (pp. 8 ff.). Such productive resources are indeed goods; they are distinguished from directly consumable goods, "goods of first order," by the appellative "goods of higher order." If bread is a first-order good, flour, salt, fuel, and the baker's services are second-order goods, wheat is a third-order good, etc.

Menger's differentiation of productive resources from consumption goods solely on the basis of proximity to consumption led to a result important to economic theory. Why should not the same theory that is used to explain the value of consumption goods be applied to "unripened" consumption goods? Quite obviously it should be, and Menger's application of his value theory to production goods led to a correct if not wholly adequate statement of the marginal productivity theory of distribution.

The classification of goods into ranks was in itself, however, of dubious value. The same good, say coal, might be used both as a good of second order (in domestic heating) and perhaps as a good of ninth order (in smelting ore) in even a simple economy. And to attempt to trace in detail the stages in the production of even a simple commodity—a common pin, for instance—in the highly complex modern economy would amount to nothing less than a detailed description of economic life and its history! The concept of ranks is too precise, in other words, either for our analytical

powers or for our analytical requirements. Menger himself makes no use of the concept of ranks other than to distinguish consumption goods from production goods; he says that the chief use of the concept is in providing an "insight into the causal relationship" between goods and want-satisfactions (p. 10).

One peculiarity of goods of higher order, Menger notes, is that they cannot produce goods of lower order without the co-operation of other, "complementary" goods of the same order (pp. 11 ff.).[7] It follows that, if the complementary goods of higher order are lacking,[8] the "good" in question cannot satisfy wants even indirectly, and is useless; it is no longer a good.

A second peculiarity of higher-order goods is the dependence of their own want-satisfying power on the want-satisfying power of their final, first-order products (pp. 17–21). This is the germ of the theory of distribution through "imputation"—i.e., the derivation of the value of productive agents from the value of their products.

> It is now clear that the existence of unsatisfied human needs is the condition of each and every *Güterqualität*, and this substantiates the principle that goods lose their *Güterqualität* as soon as the needs whose satisfaction they previously served have disappeared. This is equally true whether the goods in question can be used directly in primary relationship to want-satisfaction or whether they secure their *Güterqualität* through a more or less mediate causal nexus leading to the satisfaction of human wants [p. 18].
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> . . . . . .
>
> The requirements for goods of higher order are conditioned by our requirements for goods of first order . . . . [p. 35].

Human wants are thus the ultimate basis of all *Güterqualität*. Were people to lose their taste for tobacco, then cigars, cigarettes,

[7] Menger saw what on occasion some of our modern theorists have failed to see: that where there is only one productive factor and one product that factor must be economically identical with its product, for no change could have taken place in the factor in the absence of another factor. Where this heroic construction is assumed it is nonsense to speak of costs, returns, or distribution.

[8] The definition of complementary goods is extended (p. 14) beyond its original meaning to include all goods of higher orders needed to transform the higher good in question into a final product. This is done to avoid the situation where, for instance, all the necessary complementary goods of third order might produce a good of second order which, however, lacked the complementary goods of second order necessary to transform it into a final product.

and pipes, tobacco stocks, importers' technical services, factories and even tobacco plantations—all these would lose their *Güterqualität*.

The final peculiarity of goods of higher order to be noted at this point is the fact that their utilization always consumes time (pp. 21–26). Since, in the absence of complete knowledge and of complete control over nature, the future is not certain, the *anticipated* want which will be satisfied by a good of higher order at the end of its production process determines its *Güterqualität*. We may defer further consideration of higher-order goods to the section on Menger's theory of distribution.

So far Menger's theory has been presented only in its broad lines of qualitative causality; the quantitative aspects must now be sketched. Two preliminary concepts are of importance: (1) *Bedarf* (requirements), or the amount of each kind of good which an individual requires to satisfy all his wants within a given period of time (p. 34), and (2) supply, or the quantities of the various goods which are available to meet these needs during the same period of time (pp. 45 ff.). Menger's concept of *Bedarf* has no exact English equivalent. His definition and treatment suggest that the *Bedarf* of an individual is the quantity of goods necessary to bring about a complete satisfaction of that individual's needs (cf. pp. 34 and note, 38, 41).[9] He admits that human needs are indeed capable of indefinite development (*ins Unendliche entwicklungsfähig*), but this is a historical phenomenon; for sufficiently limited periods of time *Bedarf* is a fixed datum (p. 38).

An elaborate argument is presented (pp. 35–50) to prove that these two types of information, on *Bedarf* and on supplies, can legitimately be treated as known data in the analysis rather than analytical results (such as prices). This demonstration was highly essential, for the classical economists, whose analytical methods were even more advanced than those in contemporary German economics, did not assume productive resources to be given in amount.[10] Menger, on the other hand, clearly includes goods of

[9] *Bedarf* is therefore closely related to Walras' *utilité d'extension;* cf. *Eléments d'économie politique pure* (1926 ed.), 72 ff.

[10] As Professor F. H. Knight has pointed out: "The stationary state of these classical writers was the *naturally* static or economic condition, which is the goal

higher order, or resources, among his fixed stocks (pp. 45–51). He must be considered one of the first economists to introduce the indispensable methodological tool of "static" assumptions into economic analysis. His treatment is, to be sure, primitive and oversimplified in the light of present-day accomplishments, but at the time it was a distinct innovation. In this respect, moreover, he was more influential, although less rigorous, than Walras, and distinctly superior to Jevons.[11]

One particular merit of Menger's treatment is his emphasis on the time dimension of these quantities—i.e., the fact that our requirements for and supplies of goods must be stated in terms of quantities per unit of time. This important point is obscure in Jevons and it is customarily ignored in modern textbooks on economics.[12]

With these two sets of data, supplies and requirements (each per unit of time), it is now possible to face the basic economic question: How should the given quantities be distributed to secure the greatest possible satisfaction of needs (pp. 51 ff.)?[13] Requirements (*Bedarf*) and available stocks stand in one of three possible relationships to each other: either may be greater than the other, or they may be equal.

Requirements, first, may exceed available quantities—the relationship which is to be observed "with the vast majority of

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of progress . . . . not a state made static by arbitrary abstraction as a methodological device" (see *Risk, Uncertainty, and Profit*, p. 143 n.). Cf. also the penetrating analysis of L. Robbins, "On a Certain Ambiguity in the Conception of Stationary Equilibrium," *Economic Journal*, XL (1930), 194–214.

[11] Jevons had but a suggestion (*Theory of Political Economy* [4th ed.], p. 267; Walras' genuine advance was obscured from the view of most economists by its mathematical garb (*op. cit.*, esp. pp. 175 ff.).

[12] In the numerous sections on dimensions of economic quantities which constitute the chief textual additions made in the second edition of the *Theory of Political Economy* (cf. 4th ed., esp. pp. 61 ff.), Jevons moved much closer to the conclusion that economic quantities must possess a time dimension. His treatment was naïve and unsatisfactory, however. Cf. P. H. Wicksteed, "On Certain Passages in Jevons' Theory of Political Economy," *Quarterly Journal of Economics*, III (1889), 293–314 (reprinted in *Common Sense of Political Economy* [1934], Vol. II).

[13] The present discussion will be limited to goods of first order.

goods." In this case the loss of a significant part of the stock will cause some known need to remain unsatisfied. Accordingly:

> People will endeavor . . . . to secure the greatest possible result by the intelligent application (*zweckmässige Verwendung*) of every given unit (*Teilquantität*) of the goods which stand in this quantitative relationship, and, similarly, to secure a given result with the least possible quantity of such goods . . . . (pp. 52–53).[14]

The individual will therefore devote such goods only to his "more important wants." Goods in this relation—i.e., smaller in quantity than the requirements for them—are "economic goods"; they will be kept, conserved, and used only according to the principle of economic behavior just quoted. Costs of any sort are per se irrelevant to the question of whether a good is economic or non-economic (p. 61 n.).

The second possible relationship holds when available stocks exceed requirements (pp. 57 ff.). Under this circumstance there is no inducement to husband the goods in question, to conserve their useful properties, to consider the relative importance of the wants they can satisfy, or, in general, to treat such goods in an economic manner. They are, in short, "non-economic" goods.

Changing times or circumstances may turn "non-economic" goods into "economic" goods, or vice versa (pp. 60 ff.). Factors contributing to a change in the relationship of supplies to requirements include changes in population, changes in human wants, the discovery of new want-satisfying powers of goods, and, of course, the depletion of resources. But this is historical change, external to Menger's theoretical corpus, and need not be pursued. The third possible relationship between requirements and supplies, that of equality, is even less significant, and will be passed over.

We are now on the threshold of the quantitative determination of subjective value. One further preliminary step is necessary, the classification of wants according to their importance:

> If we have indicated correctly the nature of the value of goods, so that it is established that in the last resort only the satisfaction of our wants has significance for us and that all goods clearly secure their value by a transfer

[14] For the translation of *Teilquantität* as "unit" see below, p. 241.

to them of this significance, then the *differences* in value of various goods, which we can observe in actual life, can be based only on the differences in the significance of those want-satisfactions which depend on disposal over these goods [p. 87].

Obviously our different classes of wants are of widely differing importances to us: food, clothing, and shelter are indispensable; other goods, such as tobacco and chessboards, serve only to add comfort or pleasure (pp. 88 ff.). And not only do our specific kinds of wants, and accordingly their satisfactions, differ in importance, but our satisfaction of a particular want will be more or less complete as the quantity of goods available to meet it is greater or smaller (p. 90). A little food preserves life, more food insures health,[15] and additional quantities bring amenities, but to a decreasing extent,[16] until a point of satiation is reached (p. 91).

Menger illustrates by an arithmetical example the differences in the importance of the satisfaction of various kinds of wants and the decrease in the importance of the satisfaction of each kind of want as the quantity of the good satisfying that want is increased (p. 93). This table is reproduced here in a slightly condensed form:

I	II	III	IV	...	X
10	9	8	7	...	1
9	8	7	...	...	0
8	7	...	1		
7	...	1	0		
...	1	0			
1	0				
0					

The columns I–X represent different kinds of wants, in the order of their importance; the numbers in any column represent successive want-satisfactions from unit increases of the stock of goods satisfying that want—in modern terms, the "marginal" utilities. Column I may represent food; Column IV, tobacco. Ten units of "food" represent the individual's *Bedarf* for food.

[15] But this additional food will be of a different type. Menger is speaking of broad classes of wants, not of the wants for specific goods. This ambiguity is never cleared up, unfortunately.

[16] ". . . . die darüber hinausgehende Befriedigung aber eine immer geringere Bedeutung hat" (p. 92).

Menger probably does not mean to say that the first unit of tobacco yields a satisfaction equal to that of the fourth unit of food, but only to indicate orders of importance; but unfortunately he is not precise as to the meaning of his magnitudes. He states that the "economizing" individual seeks to equalize all these margins in order to maximize his want-satisfaction: " . . . . The individual will endeavor . . . . to bring the satisfaction of his needs for tobacco and for means of sustenance into equilibrium" (p. 94). Indeed it is this " . . . . weighing of the different importances of wants, the choice between those which remain unsatisfied and those which, *according to the available means*, get satisfied, and the determination of the degree to which these latter wants get satisfied" that supplies the most consistent and influential motive in man's economic behavior (pp. 94–95 [my italics]).

This endeavor to maximize want-satisfaction by equating the "marginal" satisfactions of all wants can take place only through the allocation of income, and indeed Menger's theory of the distribution of "available means" seems to approach this.[17] Yet it is not clear that Menger sees the rôle of completely general purchasing power, for in the subsequent discussion he speaks of quantities of specific goods in relation to their limited possible uses—e.g., the farmer's corn may be used for food, seed, feeding cattle, etc. (pp. 95 ff.).

Elsewhere he notes that the ability to satisfy more than one want (or column) is a power possessed by "most goods" (p. 112 n.). He does not distinguish satisfactorily between goods which satisfy the one want and those which can satisfy qualitatively different wants.[18] But Menger's solution is, for the latter case, clear and correct:

If a good is able to satisfy different types of wants, each of which has decreasing significance with the degree of completeness with which it has

[17] If the allocation of income is intended, then not marginal utilities but marginal utilities divided by prices, or in terms of units of equal value, are equated, of course. But we must not expect such refinement of statement from Menger.

[18] Menger does not seem to realize the fundamental difficulties involved in making this distinction; difficulties which have manifested themselves so successfully in preventing the development of a satisfactory definition of a commodity. But although the basic problem is still unsolved (and probably will remain so), Menger's development is crude in comparison with modern statements.

already been satisfied, the economic man will direct the quantity at his disposal first to the satisfaction of the most important wants regardless of what type they may be, and the remainder will be devoted to those concrete want-satisfactions which are next in importance, and so on with the filling of less important wants. This practice has the result that the most important of all those concrete wants which are not satisfied are of the same significance for all types of wants, and accordingly all concrete wants are satisfied to an equal level of importance [p. 98 n.].

Yet this is not a complete solution, since there are an infinite number of needs which any particular good cannot satisfy, and it is strange that one of the most important steps in the entire argument is found only in a footnote. Menger's failure to develop generally the method by which the individual maximizes his want-satisfaction is an outstanding weakness in his theory of value.

The valuation of a stock of goods follows directly from the principles of economic behavior and of variation in the qualitative and quantitative importance of wants. Assume that the individual has five units of the good capable of satisfying wants I and II. He will apply this stock to the three most important stages of I, with satisfactions 10, 9, and 8, respectively, and to the two most important stages of want II, with satisfactions 9 and 8, respectively. The last unit, the "marginal" application, will satisfy a want which has an importance of 8, and since by definition all units are identical, all will be valued at 8. We have then the principle of value: " . . . . The value of a unit of the available stock of a good is for every individual equal to the significance of the least important want-satisfaction which is brought about by a unit of the total quantity of the good" (p. 99 [italicized by Menger]; also pp. 107–8, etc.). Wants—equivalent to utility in Jevons—and supply are of correlative importance, so that although our need for air is great (represented by, say, Col. I), the supply is even greater and air is worthless. Diamonds are less needed (here perhaps Col. VIII), but the supply is so small that their value is high. The "paradox" of utility and value of the classicists is solved.

Menger elaborates this principle of value at considerable length by the use of examples (pp. 100–107), but only two aspects of the elaboration require attention here. He consistently adheres to a

discussion in terms of a period of time, and this means in effect an individual's budget policy for that period. This mode of analysis properly avoids the unrealistic, misleading "dinner-table" examples of diminishing utility used by Jevons and, for that matter, most modern texts. A true understanding of diminishing utility cannot be secured by plying a person with successive oranges—"the desire of food is limited in every man by the narrow capacity of the human stomach." The important fact that every orange is the "marginal" orange is better shown by asking the same person to determine what portion of a limited budget for, say, a six-week camping trip would be devoted to oranges.

Second, there is little doubt but that Menger is discussing only relative utilities; the numerical examples are illustrative only of ordinal, not cardinal, relationships. These numbers serve to express "not the *absolute*, but rather the *relative* magnitudes of the significance of the want-satisfactions in question" (p. 163 n. [his italics]; cf. also pp. 92–93, 100–107). In this respect Menger's formulation of the theory of subjective value is a good deal closer to the modern tendency in the treatment of utility than are the expositions of Jevons and Walras. Here it should also be mentioned that although Menger is a thoroughgoing hedonist, he does not follow the later utilitarian practice of comparing the utilities of different individuals.[19] He explicitly denies the validity of such concepts as the "average man" and "average requirement" (p. 110 n.). It is a source of regret that this insight—which was shared by Jevons—was lost to his less gifted disciples. Böhm-Bawerk shamelessly compares the "utilities" of rich and poor,[20] and the purpose of Wieser's metaphysical concept of "natural value" is to overcome the nonexistent difficulty for the marginal utility theory of prices that the utility of a good varies between rich and poor individuals although the price is the same to all.[21]

The interesting question of the right to attribute a "marginal"

[19] There are minor lapses from this position in the later chapters on exchange and price, but they are infrequent and never affect the basic argument (cf. pp. 162 ff.).

[20] "Grundzüge der Theorie des wirtschaftlichen Güterwerts," *Conrad's Jahrbücher* (1886), *London School Reprint No. 11*, p. 118.

[21] *Natural Value* (1888), Book II, *passim*.

or "incremental" utility theory of value to Menger may be considered briefly. His analysis is always in terms of the *Teilquantität*—literally the fraction or portion. Yet at numerous points the word is qualified: "practically significant portion"; "portion which is just observable."[22] It seems clear that Menger is thinking in terms of small, finite quantitative changes, and not of infinitesimals. He, unlike his co-discoverers of the utility principle, Walras and Jevons, probably had no mathematical training, and would therefore use such a common-sense approach rather than the convenient analytical concepts of continuity and derivatives. The concept of a small finite change is, of course, more realistic. In a mathematical treatment it yields a slightly indeterminate solution: the value found by withdrawal of a unit is larger than the value found by addition of a unit. But the realistic mathematician has the same problem if he postulates a limited power of discrimination on the part of the consumer, as with Edgeworth's "minimum sensibile."[23] Accordingly, Menger seems clearly to have formulated a "marginal" utility theory (although, as with Jevons, Menger devotes little attention to total utility).

The fundamental principles of Menger's theory of value have been presented in considerable detail, because it is on these important fundamentals that it is so strong. We must be content merely to suggest certain points which are developed in the later chapters on exchange and price. There is a good though simplified development of exchange equilibrium: the individual will equate the marginal utilities of different commodities in the special case of equal prices (esp. p. 168).[24] An anticipation of Edgeworth's contract curve (p. 178), a good statement of the principle of monopoly price (pp. 198 ff.), a reference to discriminating monopolies (pp. 196–97), a discussion of demand elasticity (p. 197 n.), are points which must be at least mentioned. In general it may be said that the analysis of demand is excellent, the analysis of supply factors distinctly less satisfactory.

[22] Thus, pp. 52, 77 (twice), 83, 102, 103, etc.

[23] Cf. the remarks in *Mathematical Psychics, London School Reprint No. 10*, pp. 7, 60, 99–100.

[24] Menger did not see that the units of all commodities could be so defined that they have equal prices.

PRODUCTIVE ORGANIZATION: THE ALLOCATION OF RESOURCES

Menger lays the groundwork for a correct theory of productive organization—i.e., for the determination of the allocation of resources. The final development, however, the theory of alternative cost, is left for Wieser to formulate.[25] This great hiatus in Menger's theoretical system is very hard to explain, especially since the correct allocation of resources is suggested in the footnote which has already been quoted in connection with his value theory (see above, pp. 238 f.). There, it will be recalled, Menger suggests that the most economic utilization of a good which satisfies several wants is to equalize its "marginal" significances for all wants. This pregnant suggestion, which contains the heart at once of the alternative-cost theory of value and of distribution theory, is never elaborated, nor is it applied directly to the problem of resource allocation.

Menger's preoccupation with directly consumable goods probably plays a part in the fundamental defect in his theory, the neglect of costs, but a more important explanation lies in his failure to realize the continuity of production—i.e., to realize that the price of a good must be sufficient to repay its costs (which are the products its resources could produce elsewhere) if the industry is to hold the productive resources used in it. This failure appears most clearly in his criticism of the cost theories of value (esp. pp. 119–22). As Menger says, historical costs are irrelevant to value; a diamond is equally valuable whether it has been found or is the product "of a thousand days of labor." And it is true that

> experience also teaches that the value of the productive factors necessary to the reproduction of many goods [e.g., clothing which is no longer in fashion, obsolete machines, etc.] is much greater than the value of their product, and in many other cases their value is less than that of their product [p. 121].

But it is a *non sequitur* to argue from this, as Menger unfortunately does, that costs cannot influence value (pp. 119 ff.). He fails to consider the fact that although costs never have a direct

[25] Wieser's first publication, *Über den Ursprung und die Hauptgesetze des wirtschaftlichen Wertes* (1884), pp. 146–70, gives the essentials of the alternative cost theory. Wieser himself, however, never applied the theory correctly to the problem of distribution.

effect on value, yet they are—"in the long run"—of at least co-ordinate importance in its determination, and in the limiting case of constant costs they are completely dominant. Only for very short periods of time is the supply curve of a commodity, assuming it to be perishable, so inelastic in comparison with its demand curve that the former may be ignored in price determination. And supply curves become more elastic as the time available for readjustments of scale of output increase, because resources become more mobile as between industries, and the influence of supply on price first becomes equal to and then typically exceeds that of demand. Under certain assumptions such as atomistic competition, non-specialization of resources, and unlimited time for full adjustment of the productive organization, constant costs tend to prevail and, in so far as that condition is approximated, demand determines only the quantity of a commodity sold, not its price. Menger's theory is therefore applicable only to very short-run "market" prices, and his failure to recognize the increasing mobility of resources through time vitiates, accordingly, his refutation of cost theories of value. This is also true of his criticism of classical theories of rent, wages, and interest (pp. 143–52), but this aspect may be deferred to a later point.

Menger does, however, make one specific contribution to production theory, a contribution the importance of which literally cannot be exaggerated. That contribution consists in the realization that the proportions in which productive agents may be combined to secure the same product are not fixed—the law of "proportionality" or "substitution":

> Now it is quite true that we have disposal over quantities of goods of lower order only by means of *complementary* quantities of goods of higher order, but it is equally certain that not only fixed quantities of the individual goods of higher order can be brought together in production, somewhat in the manner in which this is observed in chemical compounds. . . . . Rather we are taught by the most general experience that a definite quantity of any good of lower order can be secured from goods of higher order which stand in very different quantitative relationships to each other . . . . [p. 139, also p. 140].

This formulation of the principle of variation of proportions as a *general* rule governing *all* resources is one of Menger's greatest

achievements, one which he is not required to share with either Jevons or Walras.[26] Classical theory recognized, of course, the possibility of varying the amount of capital-and-labor which could be applied to a given piece of land, and this was basic to the Ricardian theory of rent. But the proportion between labor and capital was generally assumed to be fixed; certainly variations in this proportion played no part in accepted classical theory.

The significance of the principle of variation of proportions is apparent. It leads directly to the marginal productivity theory of distribution (see next section). Until the principle of proportionality was fully developed, furthermore, no satisfactory solution of the problem of resource allocation was possible. Finally, as long as discussion ran in terms of fixed proportions between productive agents (or the question was ignored), the individual firm could not be used for purposes of analysis. A firm would require all factors in fixed relation to output; only socially—i.e., by general equilibrium analysis—would it be possible to fix the values of individual agents. It was a genuine retardation of economic advance that Wieser and Böhm-Bawerk (the latter in an incredibly crude manner) returned to the assumption of fixed-coefficients.

Quite surprisingly, Menger fails even to mention explicitly the technical principle of diminishing returns from an increasing proportion of any agent in a combination, and, accordingly, to realize its importance for his theory of distribution. The theory of marginal productivity leads to absurd results if any factor is assumed to be subject to increasing or even constant returns. But such an assumption is itself much more absurd, for no problem of resource allocation would arise. Nevertheless, opponents of the marginal productivity theory (e.g., Hobson) have occasionally used examples of increasing returns in "refutation."

One final point of excellence in Menger's brief treatment of production deserves notice: the absence of the classicists' "holy

[26] Walras recognized the principle as early as 1876 (*Théorie mathématique de la richesse sociale* [1883], pp. 65–66), but he did not add the marginal productivity theory to his original fixed-coefficients approach until, I believe, the third edition of the *Eléments* (1896).

trinity" of land, labor, and capital. Productive factors are simply goods of higher order; the services of labor, land, and capital goods are on the same footing (p. 139). In Menger's treatment, in fact, specific productive agents are not grouped into arbitrary categories which lack economic significance. As a result, his theory of imputation, now to be considered, gains a symmetry difficult to secure so long as the classical trichotomy ruled economic discussion.

THE THEORY OF IMPUTATION

The greatest contribution of the theory of subjective value to theoretical economic analysis lies in the development of a sound theory of distribution—i.e., the view of distribution as the allocation of the total product among the resources which combine to produce it, through value imputation. Prior to Menger no satisfactory theory of distribution had emerged. The classical analysis was one of the division of income between social classes; Smith and his followers never confronted the problem of how a given product may be imputed to the resources which co-operate in its production or considered distribution as a value problem. Menger was the first economist to raise this question, and, moreover, to suggest the proper manner of answering it.

The outlines of the theory of imputation (*Zurechnung*)[27]—i.e., the valuation of productive goods on the basis of their contribution to the value of their products—have already been indicated.[28] Productive goods—goods of higher order—secure value only because they can satisfy wants indirectly, by producing consumption goods (pp. 67–70, 123–26, etc.). This leads to the general theorem of imputation: " . . . . The value of goods of higher order is always and without exception determined by the anticipated value of the goods of lower order in whose production they serve" (p. 124). The element of anticipation arises from the fact, previously noted, that production requires time.

The theory of the valuation of individual goods of higher order

[27] The word *Zurechnung*, as well as the word "margin" (*Grenze*), is due to Wieser.

[28] *Supra*, pp. 232 ff.

then follows from the theories of imputation and the theory of variation of proportions:

> . . . . The value [of a quantity of a good of higher order] is equal to the difference between the significance of that want-satisfaction which would result if we had disposal over the quantity of the good of higher order whose value is in question and the significance, in the contrary case, of that satisfaction which would follow from the most economic application of the totality of goods of higher order in our possession [i.e., the remaining resources of this and other kinds] [p. 142].

The context (esp. pp. 139–40) makes it fairly clear (though not so clear as could be desired) that Menger is here, as elsewhere, speaking of the effect on the total product of the withdrawal of a *Teilquantität*—a unit—of a resource. This marginal product fixes the value of the resource.

Two cases are distinguished. When the withdrawal of one unit forces co-operating agents to seek employment in less profitable lines—the case of fixed proportions—the value of the variable factor equals the total loss of product minus the product secured by the complementary factors in other industries. But more commonly the proportions in which the factors may combine are variable, and then the withdrawal of one unit of one agent is accompanied by a rearrangement of the remaining factors,[29] and the diminution of quantity or quality of the product determines the value of the unit which has been withdrawn.

As far as this theory goes—and it is unquestionably superior to any preceding explanation of the determination of the value of productive agents, with the possible exception of that of von Thünen[30]—it is essentially correct. The only real criticism is to be leveled at its inadequacy: Menger has failed to develop the indispensable postulate of diminishing returns; and it is not clearly brought out that the units withdrawn must be small; and the

[29] This necessary element of rearrangement is strongly implied (esp. p. 140) but not separately considered.

[30] Menger appears not to have known of von Thünen, but his knowledge of the literature was great. The *Grundsätze* cites over one hundred and fifty economists, including apparently all the important names in the science down to his time except von Thünen, Gossen, and Cournot.

question whether this method of valuation of agents exactly exhausts the total product is not raised.

One general weakness in Menger's exposition which clouds his value theory but is particularly deplorable in his distribution theory is the failure to differentiate between goods and their services. The value of a good, whether used in production or consumption, is less than the aggregate value of its services during its "lifetime" if this is of appreciable duration. Nowhere does Menger clearly recognize this fact; its incidence on his theory of capital will be seen to be particularly heavy.

THE DISTRIBUTIVE SHARES: CLASSICAL THEORY

In a noteworthy section entitled, "On the Value of Land and Capital Uses and of Land Services in Particular" (pp. 142–52), Menger offers a trenchant criticism of the classical division of the "factors" of production. Ricardo had recognized (however rightly) that the value of land was not due to the labor expended upon it, and to reconcile this fact with his labor theory of value he established land as a separate category of goods. Menger's comment is brilliant but inconclusive:

> The methodological misconception which lies in this procedure is easily perceived. That a large and important group of phenomena cannot be reconciled with the general laws of a science which concerns itself with these phenomena, is clear proof of the need for reform of that science. It is not, however, a ground for the separation of one group of phenomena from the remaining objects of observation which are completely similar in their general nature—which would justify the most dubious methodological expedients—, and for erecting special highest principles for each of the two groups [pp. 144–45].

Menger's criticism is valid, but he fails to establish the fundamental economic identity of land and other forms of capital on which the criticism must rest. The recognition of this dualism in the classical theory of value had led some economists (Canard, Carey, Bastiat, Wirth, and Rösler are cited) to attempt to trace land values back to labor expenditures. Menger refutes this argument quite effectively in an emphatic statement that historical costs are irrelevant to present value (p. 145).

Ricardian rent theory is explicitly but inadequately contested as a special case of classical distribution theory. Menger fails to to see that "the different qualities and locations of ground-plots" are not an essential feature of the classical doctrine; rent may equally well be measured from the intensive margin. As a consequence it is wrong to say that, "if all plots of ground were of equal quality and of equally favorable location, according to Ricardo they could not yield any rent . . . . " (p. 146). One must regret his too ready concessions that land is usually available only in a definite quantity, "not easily increased," and that immobility of land has the economic significance generally imputed to it. Under Menger's implicit static assumptions, capital and labor are also fixed in quantity; historically all three "factors" have experienced enormous increases. Immobility, again, is a technical attribute; the mobility of land as between different uses is much more important from the viewpoint of price theory (which, indeed, usually abstracts from transportation costs) than is spatial immobility.

Menger considers observable divergences of actual wages from those necessary to maintain a laborer to be a sufficient basis for a categorical denial of the subsistence theory of wages, and he suggests that wages depend, in fact, only on the value of the product of labor (pp. 150–51). This criticism of classical doctrine is also inconclusive, for, to the extent that wages govern population, the supply of labor may conceptually be so regulated that wages remain at a subsistence level. But again, as in the case of rent, he properly believes wages to be explicable by general value theory.

The greatest hiatus in Menger's system of distribution is unquestionably the virtual absence of any theory of capital.[31] Here the failure to distinguish between goods and services from goods is a fundamental weakness. Some beginning is made: It is asserted both that increases in capital can take place only through extensions of the (undefined) period of production (p. 127) and that all such extensions increase the productivity of capital (p.

[31] Menger denies the validity of the abstinence theory of interest on his usual grounds for dismissing subjective costs—i.e., capital value frequently appears without any self-denial on the part of the capitalist, as in the pre-emption of natural resources (p. 133 n.).

136 n.). Menger thus sketches out what Böhm-Bawerk later developed.

Menger finds two limitations to increasing produce by extending the period of production: (1) the necessity for maintaining life (in a broad sense) in the immediate future and (2) an irrational preference for present over future satisfactions (pp. 126–28). This second factor, it may be noted, was deleted by Menger from the second edition, lest it be construed as supporting Böhm-Bawerk's theory of interest.[32]

Finally a vague and unsatisfactory definition of capital is presented:

> . . . . The possibility of participating in the economic advantages which are bound up with production by goods of higher order . . . . is dependent for every individual on his disposal in the present over quantities of goods of higher order for the coming period of time, or, in other words, on possessing *capital* [p. 130, also pp. 127–33].

Capital, then, is defined as goods of higher order kept in possession through a production period. This is clearly an inadequate definition, and provides no basis for a theory of interest, although such capital services (*Capitalnutzungen*) must, as Menger says, be compensated (pp. 133–36).

Other than the *Grundsätze*, Menger's only work in economic theory proper is the article already mentioned, "A Contribution to the Theory of Capital," which appeared in *Conrad's Jahrbücher* in 1888.[33] Here again no positive theory is presented, but the essay does contain two important principles. There is, first, an acute criticism of the classical emphasis on the technical, in contrast with the economic, character of capital. His comments on the validity of the practice of considering land and labor as "original" factors, capital as a secondary or derivative factor, really leave very little to be said on this subject.

The second theme of the article, which is in some respects even more important, is the necessity for conducting capital analysis

[32] Cf. Introduction to second ed., p. xiv.

[33] Reprinted in Vol. III of the *Collected Works*, pp. 133–83.

in the monetary terms in which entrepreneurs deal with capital problems:

> The real concept of capital includes the productive property, whatever technical nature it may have, so far as its money value [*Geldwert*] is the subject of our economic calculation, that is, if it appears in our accounting as a productive sum of money.[34]

These are profound truths; we can only lament that Menger does not build on them.

CONCLUSION

The foregoing condensation of Menger's economic theory need not be summarized, yet a word may be added with respect to the general impression left by the *Grundsätze*. Its caution—almost clairvoyant—in the development of basic economic concepts, the beautifully logical symmetry of its structure, its critical attitude toward received doctrine—these are impressions which can hardly fail to be left by a reading of the text. Certainly the most antagonistic cannot deny Menger a prominent place in the hall of economic fame, and the more enthusiastic, of whom the writer is one, will feel little hesitancy in acclaiming the *Grundsätze* as a treatise which is in fundamental respects unexcelled by any other between the *Wealth of Nations* and Marshall's *Principles*.

[34] *Ibid.*, p. 174.

BOOK REVIEWS

Canadian-American Industry: A Study in International Investment. By HERBERT MARSHALL, FRANK A. SOUTHARD, JR., and KENNETH W. TAYLOR. New Haven: Yale University Press, 1936. Pp. xv+360. $3.00.

This volume is the first to appear in an elaborate series, designed in time to stretch to some thirty volumes, devoted to the many and varied aspects of Canadian-American relations. These investigations are being carried out under the general editorship of Dr. James T. Shotwell, director of the Division of Economics and History of the Carnegie Endowment for International Peace. The immediate editors charged with the planning and oversight of the present volume are Professor Jacob Viner, of the University of Chicago, and Professor Harold A. Innis, of the University of Toronto. Additional evidence of the international co-operative character of the study in question lies in the fact that both countries were represented in the selection of the three authors. They are associated, respectively, with the Dominion Bureau of Statistics, Cornell University, and McMaster University.

At the very outset it may be said that the high expectations created by the advance announcement of this study have been abundantly realized. This initial volume may with some justice be called a pioneering enterprise. It constitutes the first attempt to make a detailed survey of the vast movement of industrial capital across the Canadian-American boundary line. This movement, both in magnitude and in persistence, is probably unique today in the world. Approximately four billion dollars of American money is invested in Canada and a proportionately larger amount of the industrial capital of Canada is invested outside of that country.

The term "Canadian-American" is applied by the authors to the many hundreds of enterprises, engaged in mining, manufacturing, merchandising, finance, transportation, etc., which, located in the one country, are controlled by citizens in the other. These companies form the subject matter of this book: why they have been established, their history and importance, their mode of operation, and their position in the economy of which they are part. The industrial and financial expansion of the nationals of one country into the territory of the other

is not a new phenomenon; for "as early as 1840 American enterprise was spilling over into Canada, and by the 1880's Canadian branch plants began to appear in the United States" (p. 2). Yet, despite the fact that it has been a two-way movement, the impact of the United States on the Canadian economy is naturally, of course, "of almost immeasurably greater consequence to Canada than is the impact of Canada on the United States to the American." Throughout the volume the authors have been at pains to point out that the so-called "branch-plant movement" is not to be interpreted in terms of "economic imperialism," save in a very few cases (p. 3). Instead they view "these cross-Border outreachings not as aggrandisements but as the generally normal accommodation of mobile capital and enterprise to barriers of all sorts" (p. 177).

Following an introductory chapter, in which the historical background prior to the twentieth century is sketched, the authors proceed to review and analyze the current Canadian-American companies. Their general plan will appear from an enumeration of the subsequent chapter titles: "The Extent of American Industry in Canada," "The Extent of Canadian Industry in the United States," "Motives," "Operations," "Results," and "Consequences and Problems."

In the chapter on "Motives" it is pointed out that "Canadian-American industry, regardless of which country provides the direction, is of two sorts, and consequently owes its origin to two sets of motives. The first group is composed of mines, timber companies, public utilities, communication enterprises, stores, hotels, financial companies, and so on. The second consists of branch factories" (p. 216). For companies in the first group, the primary motives lie in the availability of raw materials and in an effort to complete or extend a service. In respect to the second group, it is revealed that the branch plant, whether it is Canadian or American, represents an attempt to overcome the handicaps imposed by import tariffs, consumer prejudice against foreign goods, or distance. Among the questions investigated in the chapter on "Operations" prominence is devoted to methods of acquiring and financing the foreign company, costs, sales policy, and advertising.

It will be impossible within the limits imposed to deal adequately with the two concluding chapters devoted respectively to "Results" and "Consequences and Problems." It will suffice perhaps to present two or three of the more significant conclusions which have been drawn by the authors. Broadly speaking, it seems to be the case that "in the

aggregate, branch plants in Canada carry on the bulk of the business which the parent companies might otherwise conceivably care for by direct export. However, it is altogether probable that most of that business . . . . could not, under existing circumstances, be held from a United States shipping point" (p. 269). Related to the foregoing is the belief that "in planning its tariff policy Canada has, throughout at least the past 35 years, been perfectly aware of the relation between the branch plant movement and tariffs" (p. 274). The establishment of American-controlled companies in Canada has fairly definitely been accelerated by increases in the Canadian tariff and diminished during periods either of quiescence in tariff-making or business inactivity. Their conclusion that "in general the Canadian has discovered that his country can import enterprise and capital and yet find no flag behind the dollar" (p. 293) will afford satisfaction to those citizens of the Dominion who have felt alarm over the possible alienation of control of their economic affairs as a result of the migration northward of American industry.

The work is a comprehensive one. Its tone is distinguished by detachment. Notwithstanding the fact that there are three authors, neither the literary style nor the quality of the content is uneven—both are admirable. The authors and the editors alike are to be congratulated.

Somewhat in the nature of a valuable supplementary note, there has been incorporated in this volume a careful and useful study of *Canadian Capital Movements and the Canadian Balance of Payments, 1900–1934*, prepared by Professor Frank A. Knox of Queens University.

THEODORE H. BOGGS

Stanford University

Neugestaltung der Handelspolitik. By LOUISE SOMMER. Vienna: Österreichischer Wirtschaftsverlag, 1935. Pp. 400. Rm. 15.

The author launches a formidable attack on the unconditional most-favored-nation clause and proposes to substitute, as respects Europe, a system of preferential treaties. The most-favored-nation principle went out of date, Dr. Sommer finds, with the political philosophy and the economic conditions of the nineteenth century. Equality was the guiding principle of the philosophy of liberalism. Just as each individual was entitled to equal treatment by his sovereign, so each sovereign state was entitled to equal treatment in its commercial relations. To-

day stateism has replaced liberalism, and neither individuals nor states can expect equality of treatment. Inequality, or discrimination, is the rule in commercial relations, and this inequality corresponds with the development of great inequalities in the economic position of trading nations. If a nation exports to fifty other nations, each of the fifty markets is not equally important and each is not entitled to the equal treatment which the most-favored-nation principle would accord to it.

The most-favored-nation clause has lost most of its force and significance. Evasions, by the use of quotas, by exchange restrictions and clearing agreements, have multiplied. The recognition of an increasing list of exceptions has shrunken the area within which the clause is applicable and thus has made its guaranties largely illusory. The author has no wish to restore the *m-f-n* clause to its pristine vigor. Discrimination is the prevailing rule in commercial policy; it is in harmony with modern political thought and with present economic conditions. Her program is to recognize and regulate discrimination rather than to attempt to outlaw it. "If this be treason, make the most of it."

The second half of the book is devoted to the elaboration of an ingenious scheme of preferential tariffs on a sliding scale. Assume that a group of countries (ten European states are chosen for illustration) have agreed to grant each other mutual preferences. How shall the degree of preference be determined in each case? Shall Austria give greater preference to Germany or to Switzerland? The author's answer is: "The degree of preference should be proportional to the *intensity* of the trade relationship." Intensity is calculated by a mathematical formula. The percentage of Austria's total export trade destined for Germany is multiplied by the percentage which Austria's exports to Germany bear to imports from Germany. The result is an index number (875) measuring the intensity of the trade relations. A similar calculation gives an index of only 512 for Switzerland. Germany, according to Dr. Sommer's formula, would get a discount of, say, 30–50 per cent from the Austrian tariff while Switzerland would have to be content with a mere 20–30 per cent. If it were desired to take account of the fact that Switzerland is a smaller country, a correction of the indices might be made by multiplying each by the per capita consumption of Austrian goods in the respective country.

The author claims for her system that it would substitute an automatic statistical mechanism for the juggling of tariff bargaining. Concessions would not be granted as favors but would be demanded as rights arising from trade relations. It is admitted that the preferential

system would strengthen the tendency toward "block-building" or regionalism, but this development is regarded as desirable.

Two possible objections to the plan, from the point of view of economic theory, are considered: (1) its emphasis on the stimulation of exports is in contradiction to classical theory and (2) preferential tariffs tend to divert the currents of trade from their natural channels. Dr. Sommer recognizes the force of these objections when applied to preferential tariffs in general, but insists they are not valid when directed against preferences granted according to her formula. In the reviewer's opinion Dr. Sommer weakens her case by trying to prove too much. The formula need not offer a perfect solution of tariff problems; it has much merit as an improvement over present methods. Neither bilateral agreements nor general multilateral treaties have accomplished much in the way of stimulating the volume of inter-European trade. Regional agreements have been the subject of a great deal of discussion. Regional agreements such as Dr. Sommer proposes are not an original solution of the European tariff tangle. Hantos and others have long advocated such agreements and steps have actually been taken in the conventions of Ouchy and Oslo toward the realization of their proposals. But the present author goes a step beyond her predecessors in her use of trade statistics in computing a formula for preferential tariff reduction. Her book is written by an economist for economists and avoids the misty political considerations which have clouded many other proposals of the sort. Whether or not an increase in national well-being would result from its adoption would depend considerably on the commodities selected for tariff reductions. On this point the author is not specific, beyond asserting that only commodities of large trade importance would be affected.

The book shows the results of a prodigious amount of reading in the field of commercial policies. The material is well organized and the language is direct and forceful.

P. W. BIDWELL

University of Buffalo

China's Customs Revenue since the Revolution of 1911. By STANLEY F. WRIGHT. (Third edition revised and enlarged with the assistance of JOHN H. CUBBON.) Shanghai: Statistical Department, Inspectorate General of Customs, 1935. Pp. iv+674.

This is a revised and enlarged edition of a well-known work first published, in 1925, under the title, *The Collection and Disposal of the Native and Maritime Customs Revenue Since the Revolution of 1911*. This book

is an official customs publication. But it is also an essay on the international economic relations of China as they are reflected in the position of the customs, the acts of the Inspector General, the collection and use of the revenue, and the related financial policy of the Chinese government. The work is therefore to be judged by its generalizations in a wider field than that of revenue statistics, by its insight into China's situation, and by its interpretation of complicated international relations.

As a source of information the volume presents important facts which are not to be found, or not readily to be found, elsewhere. It presents the life-history of every foreign and domestic loan which has been made a charge upon the customs revenue. This alone makes the work indispensable to the student.

Nowhere else is the complicated story of the financial side of the Boxer indemnity as completely told. The indemnity began with an examination of China's capacity to pay on the part of the representatives of the indemnity-levying powers and of the Chinese government. A critical study of these efforts might well be made to see what light they throw on this much used concept. The history ends with the end of the indemnity as a charge involving outpayments from the Chinese economy. What now appears on the books of the Chinese customs as the Boxer indemnity consists of the charges which are for the service of domestic loans or for education and other benefits to the Chinese people. The ending of the Boxer indemnity ahead of schedule is due to a variety of reasons. The European war and the Russian revolution played important parts. But there are still grounds for maintaining before a cynical world that the reasonableness and good will of many of the creditor powers has something to do with it. Finally, it may be maintained that the history of the Boxer indemnity carries with it a lesson for all governments, who may be placed in a position similar to that of China, not to "commercialize" a political debt but to keep it political. If the Boxer indemnity had been commercialized, it would no doubt still involve considerable outpayments from China.

The account of China's domestic loans which is presented by the authors of this book is probably unique in the completeness of its information (concerning the loans with which it deals), and in its tone of restraint and fairness to the financial authorities of the Chinese government who have had a difficult time of it since the days of the reorganization loan of 1913. It is true that the authors of this work, dealing

as they do only with the loans secured upon customs revenue, were not called upon to discuss such phenomena as the levying of illegal exactions by the military, the collection of future taxes, the seizing of railway revenues, or the Nishihara loans. No complete account of the financing of civil war in China during the past twenty years has appeared. This work does, however, provide an important part of such an account.

The authors of this work do not avoid discussing the thorny problem of the agreement of 1912 between the diplomatic body at Peking and the Chinese government regarding the control and disposal of the customs revenue. This agreement provided a way of carrying on under difficult circumstances. Its execution involved legal questions. The position of the customs officials was made difficult, and our authors show that the Inspector General and the officials of the service acquitted themselves well in an almost impossible situation. But the fundamental problem lies deeper than the legal justification of official acts.

The fundamental problem involves the nature of the adjustment between rising Chinese nationalism and international arrangements which have come down from a less nationalist past. The action of the powers in 1912 seemed to them highly expedient and no doubt seemed to them desirable even from the point of view of China. But foreign control was extended at the beginning of a period of revolution, a revolution which was certain to have as one of its aims the opposition and the curbing of foreign control. The fundamental problem lies beyond the range of usual legal proceedings or ordinary diplomatic representations. Successful Chinese nationalism will build a new foundation for China's international relations. In so far as Chinese nationalism is successful this new foundation is being built.

It may be that a true internationalism would provide a better climate for the political and economic development of China than vigorous Chinese nationalism in a nationalist world. But the claims of internationalism as a factor in China's development rest upon such things as the successful operation of the League of Nations rather than upon the Boxer indemnity agreement or the agreement of 1912 concerning the control of customs funds. The local internationalism which has been developed in China in the past looks so much like a mere understanding among creditors that it does not satisfy the hopes and ambitions of the leaders of the Chinese people.

C. F. Remer

University of Michigan

Economic Planning and the Tariff: An Essay on Social Philosophy. By JAMES GERALD SMITH. Princeton: Princeton University Press, 1934. Pp. x+331. $3.00.

Those who, like myself, have come somewhat late to the reading of Professor Smith's plea for a reform of American tariff policy will not find that the passage of a couple of years has badly dated his book. With an eye principally upon the intelligent lay citizen and the bewildered leaders of organized labor, he states competently the case for a competitive capitalist economy and effectively reminds his readers of a little of the sadly forgotten history of price-fixing experiments, in the long chain of which twentieth-century economic planning takes its modest place as the latest example of pseudo-scientific charlatanry. Thereafter Professor Smith restates the familiar case against tariffs and concludes with a "realistic program for tariff reform," including the substitution of bounties for tariffs and investing the United States Tariff Commission with the power to report on unfair trade practices in the export as well as in the import trade.

Students of economics will also profit from reading this book. To the foreign reader the hundred pages of Appendixes provide a convenient summary of recent tariff legislation and administrative changes in the United States. Professor Smith might well have increased our indebtedness had he amplified part of his argument. He might have clarified his distinction between "laissez faire doctrine" and "competitive capitalism." Is it true outside America that the rugged individualist who preaches individualism to workers "is simply employing strategy to keep his enemy divided," or that laissez faire doctrine "seeks to justify monopoly" and tariff protection (p. 55)? The rationale of the "social control" which distinguishes Professor Smith's system by "giving a somewhat higher valuation to human services" than that of classical economics (p. 202) is not crystal clear. On occasion, enthusiasm for free trade runs away with the author's pen; free trade "would wipe out the marginal high-cost producers in some industries only, it might help to wipe out some sweat-shop industries" (p. 115). Granted a connection between marginal output and sweatshops, is there, even so, any strong presumption that shifting the margin will eliminate more sweatshops than it creates at the new margin? Nor can we maintain (p. 116) that workers displaced by the lowering of tariffs will necessarily "be better off by their being transferred to more efficient work and therefore better paid work"; that

special privilege will tend to disappear. And, again, Professor Smith should be persuaded to give us a study of the economics of immigration policy. He writes (p. 132) as though the United States were now demonstrably at its optimum size of population. "Let the people come over here freely to live on our bounty and we give up some of the proceeds of our economic development; but let them stay in their own country and we gain by trade with them." Does that apply to all us foreigners?

ARNOLD PLANT

London School of Economics and Political Science

International Organization in European Air Transport. By LAURENCE C. TOMBS. New York: Columbia University Press, 1936. Pp. xx+219. $3.00.

The Paris Convention of 1919 established international public air law, and ten years later, less a day, was signed the Warsaw Convention, the first international instrument on private air law. These are the high lights of a book, chiefly legal in character, in which "an effort has been made to demonstrate that international organization in European air transport, however incomplete, is a reality," and certain to progress, although an adequate solution is as yet precluded by political factors.

Of economics and commercial policy the book from its nature contains relatively little: Civil and military aviation are inextricably interrelated. Almost without exception European airlines require governmental subsidies to survive. An international agreement for customs exemption of liquid fuel used in air transport is now open for signature. Cabotage is only exceptionally permitted to foreign aircraft. Equality of treatment for all countries stipulated in the Paris Convention is largely vitiated by the further provision that a state "may make conditional on its prior authorization the establishment of international airways . . . . on its territory," although it is ingenuously recommended that a government should not refuse such authorization otherwise than upon reasonable grounds (pp. 60–63).

Of lists, on the contrary, the book contains an abundance, which bear witness of meticulous care and impressive industry—lists of committees, of treaties, of aircraft companies, routes, and pools, and above all of countries and again of countries. There are resolutions, stipula-

tions, findings in rich profusion; and as the reader, unconversant in advance with the subject matter, staggers down the home stretch to the "Conclusion," he can with difficulty avoid a sense of confusion, although at the same time realizing that the book with its comprehensive citations is a mine of secondary source material written by a man who thoroughly knows his subject and who has used to good advantage his long experience as a member of the Communications and Transit Section of the League of Nations.

H. VAN V. FAY

Washington, D.C.

The Agencies of Federal Reserve Policy. By KARL R. BOPP. ("University of Missouri Studies," Vol. X, No. 4.) Columbia: University of Missouri, 1935. Pp. 83. $1.25.

This monograph, which is a revision of a doctoral dissertation, deals with the administration of the Federal Reserve System. In the words of the author: "What are the agencies of policy or who finally decides what shall be done?" Professor Bopp is thus not concerned with the objectives, guides, and instruments of credit policy, but with the agencies through which these policies are initiated and carried out. From various published sources he has culled out and catalogued statements which throw light on the exercise of power over discount rates, open market transactions, and the like by particular Federal Reserve agencies and officials.

The general conclusions which emerge from this study and many of the incidents on which they are based are familiar to students in the field. The Federal Reserve Act made various compromises with respect to geographical control, banker and non-banker representation, government as against private control, and centralization as against decentralization. At points, as Professor Bopp observes, the Act was rather vague in its delineation of powers. It was inevitable that there should be some shifting of powers and that the System should develop at certain points in unforeseen directions. In past years we have witnessed a gradual drift in the direction of centralization. The recent banking legislation has given a definite fillip in this direction and has sought to straighten out certain conflicts of powers responsible for friction and indecision in earlier years.

L. L. WATKINS

University of Michigan

International Economics and Diplomacy in the Near East, 1834–1853. By VERNON JOHN PURYEAR. Stanford University: Stanford University Press, 1935. Pp. xiii+264. $3.25.

In the twenty years which preceded the Crimean War, Great Britain's policy of supporting Turkey against Russia was motivated not only by calculations of power politics and concern over imperial defense but also by a desire to maintain freedom for British trade in an area where trade would surely be subject to severe restrictions if Russian rule were to be established. Palmerston declared to the House of Commons in 1849: "If in a political point of view the independence of Turkey is of great importance, in a commercial sense it is of no less importance to this country. It is quite true that with no country is our trade so liberally permitted and carried on as with Turkey." Palmerston might have added that in this matter Turkey had little choice and was bound by a treaty drawn to please England.

This major point the author establishes in a narrative which plods along on a rather tedious course through the diplomatic archives of 1834–53. The work seems to be conscientious and competent within its limits, but it is uninspired. One is in danger of not seeing the woods at all on account of the many trees that interfere with the perspective, and apparently the author feels that any one tree is just as important as any other. Furthermore, it is only the surface phenomena of diplomatic dispatches and treaties that are dealt with here. To be sure, mention is made of the development of industry in Great Britain and of trade with the Near East, but there is no real attempt to explore the processes by which these interacted with the notions of statecraft held by the statesmen and parties and diplomats concerned with Near Eastern affairs. It is important to explore the dry-as-dust archives, but what were the living forces that shaped them? Through whom did they operate? Why were they effective? These are the problems that one would like to see dealt with in a work that bears the words "international economics and diplomacy" in its title, and because they are not dealt with in this book its field of usefulness will be limited almost entirely to the professional historian who may find it helpful to have a *précis* of the dispatches of the period.

EUGENE STALEY

University of Chicago

The Theory of Free Competition. By C. J. RATZLAFF. Philadelphia: University of Pennsylvania Press, 1936. Pp. xix+341. $3.00.

The title of this book raises great expectations, for, as the author rightly observes in the Preface, "it is remarkable that a term which signifies not only so important a concept in economic philosophy, but also so dominant an institution in human activities as 'free competition' conveys such uncertain meaning." But these expectations are crushed by the contents. One has a right to expect from a professional economist who is so moved by the vagueness and indefiniteness of the concept as to write a serious work on it that he would advance a new definition which is clearer than the existing definitions, or at least attempt to extract from the latter the element common to all of them. Indeed, the author himself agrees with this view, for he assures us "that it is incumbent upon the writer to state clearly what his use [of the term] may be. Not to do so places him open to the charge of carelessness or intellectual dishonesty" (p. 2). But what does he offer us after having thus whetted our appetites? Discarding the trimmings, it is just this:

> The essence of economic competition is . . . . mobility of the factors of production or, to speak with greater exactness, proportional variability. For the existence of such mobility (or proportional variability) there are five fundamental prerequisites. Anything which extends or increases these prerequisites necessarily brings about an increase in economic competition. These prerequisites are: first, the phenomenon of scarcity (not "rarity"); second, a utilitarian outlook on life; third, knowledge of present and potential economic differences; fourth, divisibility of the factors of production; and fifth, neutralizing or eliminating those social institutions which retard unrestricted movement of the factors of production to places and activities where return is the greatest [p. 295].

Since the definition centers on the notion of mobility, it is necessary to know the meaning which the author attaches to this term. It is best to let him speak for himself:

> The mobility in this more special, definite meaning consists of two phases. These are: (1) mobility relating to the shift of land, labor, capital, and management from one product to another, or from one industry to another; and (2) mobility relating to the increase or decrease in quantity of any one of these factors.[1]
>
> The usage of mobility in this more special sense is far more accurately conveyed by such terms as "variability" and "shiftability." Are the *pro-*

[1] In a footnote the author says: "This second phase of mobility is essentially a corollary of the first."

portions in which land, labor, capital, and management *freely variable* by the *individual* producing unit? If so, mobility (and competition) exists [p. 32].

The first prerequisite of mobility (scarcity) he defines in these terms:

First, the most basic of these is the phenomenon of scarcity.[2] This is the prime motivating economic force. If scarcity did not exist mobility would cease, since satisfactions could not be increased by the expenditure of energy necessary to moving. It is very apparent that new wants, in large part as a result of the expansion of three fundamental institutions, namely, public education, transportation, and communication, have multiplied more rapidly than the wealth to satisfy those wants. In this sense scarcity has increased and added tremendously to mobility [pp. 32–33].

Applying these "definitions" to the question whether competition has increased or decreased, the author finds (p. 37) that it is "very evident" that competition has "tremendously increased" with regard to labor, and that it has also increased with regard to capital, land, and business management.

Having laid down this definition in the first two chapters of the book, the author then proceeds to examine how the concept "free competition" was used in the writings of the classical economists, of Cairnes, and of Marshall (chaps. iii, iv, and v); and what rôle the limitation of competition plays in the writings of Professor Pigou, the Fabian socialists, and the later and present-day English socialists (chaps. vi, vii, and viii). The last chapter is a concluding summary.

The discussion is prolix and most of it is beside the point. Interest centers, therefore, on what the author apparently considers his most important contribution—his own definition of competition. Regarding this definition, several questions present themselves.

Is this the clear and unambiguous definition which we have been led to expect? How is mobility to be measured? In miles per hour, or in

[2] In a footnote the author says: " 'Scarcity' is not used here in the sense of 'rarity' with which it is frequently confused. The former is a purely relative term, i.e., the means of satisfying wants in relation to the number of wants. Scarcity may be much greater in one country than in another although both countries possess the same number of people and like amount of resources, if the people in one country have developed wants (due to such institutions as public education, democratic government and churches, easy communication, and other social institutions) which the people of the other country have not developed.

" 'Rarity' is an absolute term having only the objective connotation—the amount of resources as against the number of people. Its meaning is best understood when used as opposed to 'density.' "

value of input per unit of output? From Professor Ratzlaff's conclusion that competition has "tremendously increased" in the field of labor, one would be led to conclude that by an increase in mobility he means the improvements in communication which have taken place as a result of inventions and innovations. But he is also on record as saying that mobility (competition) is ". . . . the unrestricted movement of a factor of production to places and activities where return is greatest" (p. 43). According to this definition, competition is a function of cost-price relations. If this is the correct interpretation, Professor Ratzlaff's fundamental definition is neither new, clear, nor enlightening. Let the reader compare it with any of the following authoritative definitions of competition and competitive behavior and draw his own conclusions:

a) Every economic factor seeks and obtains a maximum net income [Cournot, Malthus, Edgeworth].

b) There is but one price for commodities of the same quality in the same market [Cournot, Jevons].

c) The influence of the product of any one producer upon the price per unit of the total product is negligible [Pareto and most modern mathematical economists].

d) The output of any one producer is negligible as compared with the total output [Cournot, Marshall].

e) Each producer regulates the amount of his output without regard to the effect of his act upon the conduct of his competitors [Cournot's duopoly assumption].

f) The conditions of a *perfect* field [of competition] are four: the first pair referable to the heading *multiplicity* or continuity, the second to *dividedness* or fluidity.

I. Any individual is free to *recontract* with any out of an indefinite number, e.g., in the last example there are an indefinite number of X's and similarly of Y's.

II. Any individual is free to *contract* (at the same time) with an indefinite number; e.g., any X (and similarly Y) may deal with any number of Y's. This condition combined with the first appears to involve the indefinite divisibility of each *article* of contract (if any X deal with an indefinite number of Y's he must give each an indefinitely small portion of x); which might be erected into a separate condition.

III. Any individual is free to *recontract* with another independently of, *without the consent* being required of, any third party, e.g., there is among the Y's (and similarly among the X's) no *combination* or precontract between two or more contractors that none of them will

recontract without the consent of all. Any Y then may accept the offer of any X irrespectively of other Y's.

IV. Any individual is free to *contract* with another independently of a third party; e.g., in simple exchange each contract is between two only, but *secus* in the entangled contract . . . . where it may be a condition of production that there should be three at least to each bargain [Edgeworth].

g) The degree of competitiveness of a firm is measured by

$$\frac{x}{X}\frac{1}{\eta},$$

where x is the output of the firm, X is the output of the industry, and η is the elasticity of demand for the commodity in question. When x is negligible as compared with X, competition is "perfect"; when $x=X$, competition is entirely absent, i.e., we have a monopoly situation [Amoroso, Schultz, and others].[1]

The quality of the book may be well gauged from the fact that its 321 pages of text and bibliography contain not even a reference to any of these definitions.

HENRY SCHULTZ

University of Chicago

[1] Definitions *a–e* are discussed by Professor Henry L. Moore in his suggestive paper, "Paradoxes of Competition," *Quarterly Journal of Economics*, XX (1906), 211–30. A brief résumé of the same definitions is also to be found in his *Synthetic Economics* (New York, 1929), pp. 11–17.

Definition *f* is taken verbatim from F. Y. Edgeworth's *Mathematical Psychics* (London, 1881), pp. 18–19.

Definition *g* is the right-hand-side term of Amoroso's formula describing the equilibrium conditions of a duopolist:

$$\frac{p-\phi(x)}{p}=\frac{x}{X}\frac{1}{\eta},$$

where p is the market price of the commodity and $\phi(x)$ is the marginal degree of cost to the firm. This formula is simply another way of writing equations 6, p. 85, of Cournot's *The Mathematical Principles of the Theory of Wealth* (Bacon's trans.). See Luigi Amoroso, "La curva statica di offerta," *Giornale degli economisti e rivista di statistica*, LXX (1930), 1–26.

Since 1928–29 I have been wont to suggest to my classes in mathematical economics that the relation

$$\frac{x}{X}\frac{1}{\eta}$$

can be used as an empirical measure of monopoly power without the necessity of accepting Cournot's or Amoroso's assumptions, which underlie the derivation of the foregoing formula.

Resale Price Maintenance in Great Britain: With an Application to the Problem in the United States. By EWALD T. GRETHER. ("University of California Publications in Economics," Vol. II, No. 3.) Berkeley: University of California Press, 1935. Pp. v+78. $0.90.

While the legal development of price maintenance has been strikingly different in Great Britain as compared to the United States, the economic issues concerned are the same in the two countries. This interesting study has therefore a value for American readers beyond that signified by the title.

The most striking observation concerning price maintenance and the law is the contrast between the British situation and that in the United States, the author stating that "the legal state of affairs in Great Britain with respect to resale price maintenance would satisfy the most ardent proponents of price control in the United States, except for the fact that such control is not binding upon third parties who have obtained the goods indirectly and hence have no contractual obligations." In the sale of patented articles even this exception has been removed. The various cases resulting in this legal state of affairs are briefly reviewed, the author concluding that "thus in Great Britain the freedom of contract has been zealously upheld, and combination for the furtherance or defense of trade interests has been given legal sanction."

To give effectiveness to price maintenance much reliance is placed upon trade organization and organization among trades in some cases, as in that of the Proprietary Articles Trade Association, price maintenance being the major function of the organization. The procedure of enforcement typically involves the formation of a group of products into a "protected list," the establishment of either minimum or fixed prices, the standardization of margins in the retail and wholesale business, the imposition of regulations covering conditions of indirect price cutting, and the instituting of coordinated trade action in the enforcement of prices and supplementary regulations, culminating in the "stop list" which removes all direct sources of supplies of items on the protected list from offenders.

The associational procedure, while almost entirely effective in some cases, as in the book and photographic business, is feeble in other instances, as in confectionery, drygoods, and groceries, the system being under constant attack both from dealers outside the group and from resistance within the trade. The author believes that resale price maintenance has benefited the co-operative societies when these have

been allowed "untrammelled access" to goods without interference with their dividend system. Chain and department stores have resisted or adapted themselves "so successfully as to thrive under it." An interesting comparison of dealers' margins in Great Britain and San Francisco together with other evidence leads the author to the conclusion that resale price-fixing, when indorsed by the majority of the trade, "should tend to pyramid the influences that make for monopolistic gain."

The author believes that resale price maintenance introduces some increased rigidity into the price system and comments that competition thus "becomes tuned to service rather than to price" and also that "the danger is that the array of merchandising services will expand unduly under this sort of competitive pressure." He does not suggest a criterion for determining the point at which undue service is reached, although he cites illustrations which he evidently believes constitute such services. He suggests that this problem "is to be solved only on a basis of intimate and rigid cooperation among the members of the trade."

The analysis at this point seems less satisfactory than most of the monograph. "Undue service" when price-fixing has been undertaken is as shifty a concept as right price when prices are untrameled. Nor, unhappily, can intimate knowledge and the co-operation of trade members be relied upon for the solution. If the experience with the N.R.A. demonstrated anything, it demonstrated the weakness of trade co-operation in establishing standards for sound action in the public interest.

No statement in the monograph is more significant than that indicating that the "problem of numbers in the trade will ultimately determine whether the system will survive." Price-fixing in the form of resale price maintenance, it appears, as in other instances must be coupled with a series of other limitations if it is to be effective. Of these, none is more important than a method of keeping newcomers out of the monopoly which grows from price maintenance combined with group action to that end. To this reviewer, however, it is the group action which introduces the more serious monopoly elements. The author observes that price-fixing contracts do not provide the basis for that degree of stabilization visualized by many retailers; that, no matter how broad the legal basis, price controls will in many trades be ineffective because of resistance to their application.

The author concludes that the fixing of low limits to prices, based

upon material, merchandise, and labor costs, by providing a minimum bulwark to price-cutting "are among the least objectionable" of general price regulations. While "least objectionable" is perhaps a saving phrase, it appears to the reviewer that the N.R.A. experience with this type of bottom underprices lends little support to arguments for its use.

Barring a disagreement with one or two such generalizations as these, which seem to have no necessary relationship to the material studied, the monograph is an example of evidence well collected, well analyzed, and clearly presented—a very useful contribution to all those interested in broader problems of trade regulation as well as in the more particular issue of resale price maintenance.

LEVERETT S. LYON

Brookings Institution

The Nature of Dividends. By GABRIEL A. D. PREINREICH. New York (17 E. 42d St.): Privately printed, 1935. Pp. xii+226. $2.50.

Cutting across the legal and corporate accounting concepts relating to dividend distributions, the author attempts to clarify the nature of dividends by emphasizing the character of the investor's income. Many-sided proofs are offered to the effect that dividend distributions, regardless of form, give the investor nothing that he does not already own. The general object of the treatise is to impress the investor with the real distinction between his capital and his income and thus to facilitate the administration of, and the accounting for, his investments.

In detail, *The Nature of Dividends* considers alternative and recommended treatments of cash, property, and security dividends, reviving and reviewing in particular the old question, "Are stock dividends income?" Warrants and stock rights are also given their place in the schemes of income determination. The most signal contribution of content in the study is the author's interesting advocation of his "stock stabilization theory" of handling distributions; a system designed to keep corporate capital in constant accord with capital investment by periodic issuance and recall of par value stock as earnings are invested and distributed.

The study is not easy to read. In fact, it cannot be read; it must be translated. The ideas and concepts are expressed in formulas, complicated graphs, and pseudo-mathematical "laws." Every attempt is made to give mathematical expression to the principles of investment

value and the concepts of economic income. One addicted to mathematical thinking will enjoy the presentation immensely, but those who prefer their logic in simpler terms will tire of the formulary approach that results in a stilted style of writing.

A mathematical Appendix contains the proofs and derivations of the various formulas used in the main body of the study.

MERWIN H. WATERMAN

University of Michigan

Pioneers of American Economic Thought in the Nineteenth Century. By ERNEST TEILHAC. (Authorized English translation by E. A. J. JOHNSON.) New York: Macmillan Co., 1936. Pp. xi+187. $2.50.

Professor Teilhac's volume is an admirable example of a type of doctrinal history made familiar by the work, typically, of Rabbeno and Böhm-Bawerk. It might be described as "textual." Major compositions are subjected to refined dissections; hypercriticism is vivified by conjectural history; evaluations are reached in the abstract; interstices are filled with familiar realistics; reinforcement is given by omnibus citations.

It is not in this wise that the history of American economic thought will be written. The way is the hard, rugged path of scientific advance —a succession of meticulous monographic studies, each in its turn presenting minutiae of life and work, reconstructing details of background and setting, and disassociating the complex of political, social, and economic factors. An Olympian may skip the stages; for the run of students there is no short cut.

The editor-translator, Professor E. A. J. Johnson, has done marked service—perhaps with an excess of fealty. But even high devotion has not saved the volume from stumbling blocks in places and desolating aridity throughout.

JACOB H. HOLLANDER

Johns Hopkins University

The Crisis of the Middle Class. By LEWIS COREY. New York: Covici, Friede, Inc., 1935. Pp. 379. $2.50.

Mr. Corey follows generally the Marxian view of the historical role of the bourgeoisie. It started as a middle class between the aristocratic ruling and the peasant classes, but the middle class is now intermediate

between the big bourgeoisie and the proletariat. It played a revolutionary part in destroying feudalism and preparing a way for capitalism. Mr. Corey summarizes the middle-class revolutions in England, the United States, and France, emphasizing the diverging interests of the petty and the big bourgeoisie. The protest of the former against the monopolies and privileges of the latter tended to develop into a democratic equalitarian program, forcefully repressed in the interest of the big bourgeoisie. When the success of its fight for individual ownership tended to eliminate small property, the petty bourgeoisie turned from radicalism to reaction.

Mr. Corey develops the general Marxist approach to cover more recent events. The small individual owner made another attack upon monopoly in the latter nineteenth century. Monopoly then arose out of the new methods of production and distribution made possible by the earlier bourgeois struggle for liberty of enterprise. The small individual owner demanded first the prevention and then the regulation of industrial concentration. Once the standard bearer for constructive economic and cultural principles, he now obstructs economic progress. The concentration of economic control and the development of finance capitalism have thrust capitalism into a decline which increases the pressure on the small man.

The development of large-scale business has, Mr. Corey points out, wrought a fundamental change in the personnel of the middle class. The decline of the individual entrepreneur has been accompanied by a multiplication of salaried workers responsible for the administration of large enterprises. The white-collar workers in the upper salary brackets are identified in interest and sympathy with the big bourgeoisie. Those in the lower salary brackets are akin to the proletariat in that they are engaged in routine work and are exposed to severe technological and cyclical unemployment. The middle class consists, therefore, of representatives of two antagonistic economic systems: early industrial capitalism and later finance capitalism. The conflict between the big bourgeoisie and the proletariat is a struggle for the support of the lower layers of the middle class. Both the small property owners and the lower-salaried workers now seek security within a declining capitalism controlled by the state. They support the big bourgeoisie and fascism, which Mr. Corey regards as an attempt to erect the decline of capitalism into a system. The petty bourgeoisie abandons its traditional liberal ideals of economic and political freedom, free international trade, and peace.

The simplicity of his argument and the positiveness of Mr. Corey's conclusions arise out of his attitude to scientific data. Statistical support is offered with regard to matters extremely difficult to measure and for which data are often not available (as, for instance, the number of unemployed manual and white-collar workers in this country in 1933). Statistics are sometimes unfairly interpreted (as, for instance, when the statistics published by the Brookings Institution concerning the amount of unutilized plant are described as "a minimum estimate of the capitalist sabotage of the forces of production.") The statement that in the early years of the present century "monopoly dominated practically the whole of industry" (p. 135) is a plain exaggeration, and the conclusion that capitalism in America is now "definitely in the stage of decline" is merely a hypothesis worthy of investigation. Indeed, the major thesis is no more than a painful but quite plausible hypothesis, which loses rather than gains in force by violence and repetitiveness of statement. It depends largely upon the Marxist theory of business cycles, which is open to considerable criticism, more especially in the highly abbreviated form in which it is presented in the present work.

ARTHUR ROBERT BURNS

Columbia University

Britain in Depression: A Record of British Industries since 1929. By RESEARCH COMMITTEE OF THE ECONOMIC SCIENCE AND STATISTICS SECTION OF THE BRITISH ASSOCIATION. New York: Pitman Publishing Corp., 1935. Pp. viii+473. $3.00.

The present volume is the report of a committee appointed at the annual meeting of the British Association in 1933 by its Economics and Statistics Section to prepare a record of the effects of the world depression upon British industries. The committee consisted of Professors J. H. Jones (chairman), H. M. Hallsworth, and J. G. Smith, and Messrs. R. F. Harrod, A. Radford, and P. Ford (secretary). The report is in two parts. First comes a general survey of eighty pages, consisting of an Introduction by Professor Jones, a chapter on "Currency and Banking" by Professor Smith and Mr. G. J. Walker, and one on "Industrial Relations" by Professor J. H. Richardson. The remainder of the report (Part II) comprises twenty-one chapters covering specific industries. Each is contributed by a distinguished specialist in the particular field.

All the important branches of British industry during these years are accordingly surveyed in succession with an authoritativeness which one would expect from such a group of experts. Yet the total result falls short of one's expectations. The individual papers are, many of them, admirable within their scope and limited compass. Collectively, however, they lack uniformity in character, consistency in direction, and mutual integration. Consequently no clear picture of the fortunes of British industry as a whole during the depression emerges. It would be unfair to criticize the report on the ground that it offers no broad comprehensive interpretation of the detailed course of events, for its avowed aim was "to record the principal events and to indicate sources of data, rather than to provide interpretation." But one wonders to just what public the report will appeal, and whose requirements it will meet. Hardly the "general public." The intelligent lay reader, as also the undergraduate student, is likely to find the wood obscured by the trees, and to be somewhat overwhelmed by the detailed statistics and examination of enactments. On the other hand, the chapters dealing with particular industries are inevitably too brief—they average about fifteen pages apiece—to be of real value to the serious research worker for whom the volume is intended. He is likely already to be familiar with the condensed outline of events which is all that can be expected within such restricted space.

The bibliographies of further sources of information should on the whole prove very useful, although they vary greatly in fulness and are sometimes completely lacking, as in Professor Hallsworth's paper on "Rail Transport." The papers themselves vary greatly in character, length, scope, content, and quality. Certain of them constitute highly successful pieces of condensation. The chapters on agriculture by Messrs. Orwin and Ashby, on iron and steel by Mr. McCallum, and on wool by Mr. Shimmin are, for example, excellently concise, lucid, well rounded, and informative surveys. Mr. Bossom's chapter on the building industry, on the other hand, is devoted almost entirely to a list of titles of acts of Parliament and brief summaries of the more important ones, while other aspects of the problems and fortunes of the industry receive only a few meager paragraphs of discussion. This important subject occupies a modest eleven pages in contrast to the seventy devoted to agriculture and the forty-four to rail and road transport. It contains nothing which helps explain the surprising "building boomlet" which was such an important factor in enabling Britain to weather the depression less painfully than most countries. Professor Jones on

"Coal and Fuel and Power," Dr. Fenelon on "Road Transport," and certain others also devote their attention largely to the course of legislation in their respective fields. Other papers, of which Professor Hallsworth's on "Rail Transport" and Dr. Isserlis' on "Shipping" are examples, consist largely of statistical summaries skilfully presented. To the present reviewer (a non-specialist in the field of rail transport and therefore representative of most of the likely readers of the book), Professor Hallsworth's chapter proved for this reason less illuminating than his admirable address in the same field before the British Association in 1934. The chief criticism of the volume, however, cannot be in respect of the nature and quality of the individual contributions, but of the lack of co-ordination between them and their diversity of character, which result in the report's falling between many stools.

ARTHUR D. GAYER

Columbia University

Sweden: The Middle Way. By MARQUIS W. CHILDS. New Haven: Yale University Press, 1936. Pp. xvi+171. $2.50.

This little volume is the story of practical politics in a small country in the utmost north of Europe which has reached a high standard of material and cultural welfare through a combination of favorable conditions and intelligent political action. In a series of well-written sketches, largely based, it would seem, on personal interviews, Mr. Childs gives a broad outline of Sweden's social and political problems and of the various solutions which have been evolved to meet them. In so far as social problems are similar in most capitalistic countries, the book contains much that is of value to anyone with general social and political interests.

The control of private monopolies which has been achieved through competition of consumers' co-operatives and government-owned enterprises is one of the most significant factors of the present healthy economic life in Sweden. Mr. Childs perhaps overestimates the quantitative importance of the co-operative societies in the national economy. According to the latest data available in the census of business firms taken in 1931, approximately one-tenth of the turnover and of the personnel employed in retail trade were listed under the co-operative societies; according to Mr. Childs's estimate, the figure is one-third (pp. xv and 16). Yet Mr. Childs is entirely right in emphasizing the significance of their competition as a check on existing and potential

monopolistic practices. His dramatic descriptions of the fights between the co-operatives and the flour, rubber, electric-light bulb, and other trusts are, in my opinion, the best parts of the book. The leading role which the consumers' co-operatives have played in the rationalization of retail trade in Sweden might further have been emphasized. The co-operatives were the first to introduce chain-store organization, and their grocery stores are still regarded as models for the independent merchants.

Government-owned enterprises are found in Sweden not only in the group of "natural" monopolies such as power production, railways, and telephone and telegraph service, where the government either competes with private firms or has an exclusive monopoly, but also in the liquor and tobacco industries, in radio broadcasting, and in other divergent fields. The rapid growth of "government in business" is correctly attributed by Mr. Childs not only to the government's success in producing a cheaper and better product, but also to its ability to serve non-economic interests. The benefits of government ownership of such enterprises beyond their revenue-providing capacity are made clear: Economic and political persuasion is abolished from the broadcasting programs, the profit motive is eliminated from the production and sale of liquor, and many railways are operated at a loss in scantily populated areas of the country which would otherwise be cut off from the cultural centers.

The growth of government-owned enterprises and of consumers' co-operatives has brought improvement in quality and reduction in price for many important commodities; Mr. Childs rightly emphasizes this fact. It is only fair to point out, however, that the same development has also had a tendency to decrease the possibilities of choice between different varieties of articles. With centralized production and with the elimination of the always unpopular "middleman," his chief service, the furnishing of a great variety of products, has also disappeared.

Mr. Childs's book on Sweden is most effective, I think, if taken simply for what it is intended to be—an excellent piece of journalistic reporting, with realistic descriptions of the economic and political problems of the country, rather than as a scientific analysis of these problems or as a philosophical interpretation of the country's economic and social progress. In view of these intentions it is natural that the sections of the book which deal with purely historical material, such as the chapters on the co-operative movement, the housing program, and

liquor control, should be superior to the sections in which any factual description could only be valid if based on a thorough understanding of the underlying economic relationships, particularly such a chapter as that on banking policies, recovery measures, and unemployment relief. There are, of course, important aspects of the economic and political development of Sweden, such as the growth of the social-democratic party, the spread of economic and political education, and the development of well-organized trade-unions, which could not possibly be treated adequately in the limited space of Mr. Childs's book. In spite of these necessary lacks, *Sweden: The Middle Way* is still an illuminating and suggestive snapshot of Swedish political life.

SUNE CARLSON

Handelshögskolan, Stockholm

The Clothing Workers: A Study of the Conditions and Struggles in the Needle Trades. By JACK HARDY. New York: International Publishers, Inc., 1935. Pp. 256. $2.00.

This is a history of organized labor in the various divisions of the clothing industry, written from the left-wing or communist point of view. It cannot be taken seriously by anyone who wishes an accurate record of the facts and a careful and fair interpretation of them. The author comes to his task obviously ill prepared both through lack of knowledge and through confusion of mind as to the proper objectives of trade-unionism in these industries. The numerous blunders and their tragic consequences, which communist-led unions and factions of unions perpetrated after 1920, are not mentioned. Chronology is so distorted as to be meaningless. And economic influences are treated as if they did not exist.

A few examples should suggest the flavor of the book. At the close of an emotional account of the conditions of work before and after the rise of unionism, Mr. Hardy finds that early gains were shortly dissipated by the tactics of "reactionary" leaders. "The unions," he writes, "had been built on the platform of the class struggle. But the attitude of the union leadership became transformed into one of class conciliation and class peace. Simultaneously conditions in the shops began to grow worse." This is, of course, sheer nonsense. The industry, labor, and the union prospered during the war and the boom of 1919–20. After that, except for unusual prosperity during part of 1923, the decline set in and everyone—employers, unions, and employees—suf-

fered from it for many years. Why this group of industries and, hence, its workmen failed to share in the prosperity of the period is a problem that might profitably have engaged Mr. Hardy's attention.

In discussing a loan made by the Rochester branch of the Amalgamated Clothing Workers to a clothing company in that city, Mr. Hardy leaves the impression that the loan was forced on the members of the union. The fact is that the proposal came from members working in that shop and that the conditions of the loan were voluntarily agreed to by them. The "wage level" in the Nash plant the author puts at twelve dollars. Wages were twice that amount. Criticism of the administration of the unemployment-insurance fund in the men's clothing industry of Chicago he bases on discredited charges by a former member of the union whose own claim was heard by Professor John R. Commons, then chairman of the unemployment insurance board, and denied by him.

These illustrations are typical. This type of book, it appears to this reviewer, does a great disservice to labor.

LEO WOLMAN

Columbia University

Shutdowns in the Connecticut Valley: A Study of Worker Displacement in the Small Industrial Community. By KATHARINE DU PRE LUMPKIN and MABLE V. COMBS. ("Smith College Studies in History," Vol. xix, Nos. 3–4.) Northampton: Smith College, 1934. Pp. 135. $0.75.

The Massachusetts section of the Connecticut Valley dealt with in this monograph covers three counties—Hampden, Hampshire, and Franklin—from Springfield north to Greenfield. A long-run trend toward industrial concentration and specialization is found in the region, and it would be interesting to discover if the shutdowns discussed in the monograph represent an accelerated or a retarded movement in this direction. But, like most questions raised here, no answer is supplied.

The importance of the study resides in an analysis of the effects of a plant shutdown in one small community. This town was originally a typical New England village which began its industrial growth in the 1840's. The largest business in the community, a textile concern, employed about nine hundred workers before it shut down in 1929. Only three hundred and four of these were located for study, and they were not representative of the whole group.

Although the authors took great pains to learn everything they could about how these people lived without earnings, and although numerous tables are supplied, no clear picture emerges, and one is forced to conclude that matters of this sort are not amenable to statistical treatment. If a few family diaries or biographies could have been reconstructed, even from memory, a better understanding might well have been achieved. The method is better adapted to the study of the effects of the shutdown on the community and the futile efforts to escape the consequences.

The most important conclusion to be drawn from this experience would seem to be that it is impossible to restore an industrial community of this sort to its predepression status. Massachusetts attained an abnormally high degree of industrialization in relation to the rest of the country. It is now faced with a secular decline which began as early as 1919. Senator Henry Cabot Lodge seems to believe that higher tariffs would help, but the trouble is not international but interstate competition. The New England Council is chiefly interested in taxes. There is much lamentation about high labor standards, trade-union obscurantism, and nostalgia for the good old days.

But days were thought by many to be good before industry invaded these New England villages, and a reactionary may be permitted to suggest that they may be good again in the older way. It should be required that a poet—Robert Frost, of course—be made advisory member of all research committees in New England.

NORMAN J. WARE

Washington, D.C.

The World Agricultural Situation in 1933–1934. By INTERNATIONAL INSTITUTE OF AGRICULTURE. Rome, 1935. Pp. viii+502. L. 25.

This is the fifth of a series of volumes on the international situation as it relates to agriculture. The series is designed to supplement, in an interpretive way, the *International Year Book of Agricultural Statistics*. The subject matter falls into three quite separate and distinct parts: (1) an analysis of the trends in world-agriculture for the year 1933–34; (2) a summary of production, movement, and price trends for specific agricultural commodities; and (3) agricultural policy and conditions in different countries. The material contained in categories (2) and (3), which occupies around four hundred and fifty of the five hundred

pages, is more adapted to the use of research workers as a ready reference with respect to specific commodities and specific countries.

The first section, surveying the results of planned economy based upon the experience of the year 1933–34, is of wider general interest. Progress toward national isolation has continued along two lines. Trade barriers have become more numerous and more devious in their operations in preventing the entry of foreign goods, thus leaving domestic market prices to seek levels governed by supply and demand conditions within the country. Some countries have taken more definite steps toward price control, either by regulating production or by the adoption of price-fixing measures. Agriculture is particularly susceptible to both these types of planning. Nations dependent upon foreign sources for a portion of the farm products which they grow, more often resort to a rigorous application of the old protective policy. By this means the cost of planning is shifted to the consumer. But those countries which produce exportable surpluses find the problem less simple. They are inclined to resort to international agreements and, more particularly, to the control of production.

Economic evolution based upon international competition involved two fundamental considerations: the advantages of division of labor and expanding outlets for national production. Planned economy as it now operates embraces, for the most part, restricted outlets and, as a consequence, reduced production. It comes into definite conflict with progress in the technique of production.

The problem facing planners is that of working out a system of national planning which will achieve a balanced expansion without benefiting one branch of industry or class of society at the expense of another branch or class. The next unsolved step is that of co-ordinating national plans with the concept of division of labor in the international field. Unless this latter step is taken, planning programs will be incapable of maintaining the standard of life produced by the competitive system.

The section of the treatise dealing with trends concludes with this sentence:

> Here, as in every other field of economic activity, co-ordination, the welding together of the sectional efforts at planning into a comprehensive system of planned economy, appears as the most urgent need of the moment: a need of which the developments that took place in world economy in the course of the period under review give ample evidence.

The book meets a definite need. It is regretted that it does not appear more promptly after the close of the period covered.

ASHER HOBSON

University of Wisconsin

Tobacco under the AAA. By HAROLD B. ROWE. Washington: Brookings Institution, 1935. Pp. xiii+317. $2.50.

This book is the second in a series of six that present the various major parts of the program of the Agricultural Adjustment Administration. Its scope is restricted to an evaluation of the various procedures employed by the A.A.A. to stabilize the tobacco-growing industry. Discussion of the broader economic and of the social effects upon other groups and upon our economic system as a whole, we are told on page vii, is deferred to a subsequent volume to be published after the present series of commodity studies has been completed.

The author presents three major aspects of the tobacco program, including, first, an excellent statement of the tobacco situation; second, the tobacco program of the A.A.A.; and, third, an evaluation of the program. An Appendix includes a typical marketing agreement, a summary of production adjustment plans, and other useful exhibits.

The author has very usefully emphasized the distinguishing characteristics of the tobacco program. These include, first, the multiplicity of programs, there being six distinct programs for as many different types of tobacco; second, the adaptability of the programs to local conditions; third, the variety of devices including production adjustment contracts, marketing agreements, and codes under the N.I.R.A.; and, fourth, taxes that were used to obtain adjustment and stability in tobacco production and marketing. Special consideration might also have been given to the suitability of production control to tobacco. Bitter experience with unstable production and unsuccessful efforts with cut-outs and pools make tobacco growers unusually sympathetic toward any arrangements that approach control of production from the standpoint of the whole industry and that invoke the power of government to protect co-operating against non-co-operating growers.

The general conclusion that the tobacco program was successful in improving the income from tobacco appears substantiated by the facts. The argument advanced that further gains than those realized in 1933

and 1934 could not reasonably be expected in the long run is based, however, upon the assumption that the adjustment programs would have continued to work within the framework of the authority granted in the Agricultural Adjustment Act, and on the acceptance of the theory of parity prices. The A.A.A. program, as pointed out repeatedly by the author, was an evolving program, and there were evidences of an evolution in philosophy as well as in techniques. Therefore, it does not seem unreasonable to assume that not only might further revenues have been obtained from manufacturers (who, the author correctly maintains, absorbed the cost of the tobacco programs) but, once the concept of parity prices was discarded or modified, further income could have been obtained by passing on higher processing taxes to consumers in the form of higher retail prices, probably without seriously curtailing consumption. Because of the relatively small percentage which the cost of leaf tobacco is to the retail price of the finished product, an advance of one or two cents per package in the retail price of cigarettes, if passed back to growers, would approximately double the price that has been paid for flue-cured and burley tobacco in recent years, the principal types used in the manufacture of cigarettes. The large revenues that have been raised by taxes on tobacco and tobacco products both in the United States and in foreign countries substantiates this contention. Among all the commodities, termed basic under the A.A.A., tobacco is unique in this respect.

The Brookings Institution has rendered a distinctive service in promoting the series of contemporary studies of the A.A.A. of which this study is one. Lay and technical workers in agricultural economics will find in it a readable discussion free of the minutiae of a detailed program. To students of national agricultural policy it will be an invaluable reference.

H. B. PRICE

University of Kentucky

State Control of Local Finance in Massachusetts. By ROYAL S. VAN DE WOESTYNE. ("Harvard Economic Studies," Vol. XLIX.) Cambridge: Harvard University Press, 1935. Pp. xii+184. $2.50.

The appearance of this study marks another step in the growth of interest in the relationship of state and local finance and financial administration. Massachusetts is an especially profitable field for the study of this subject, since it affords a long period during which the

state has been experimenting with the control problem. In recent times, also, it has pioneered in developing and applying some drastic measures that were required by the misdeeds of particular municipalities.

The term "fiscal control" has been used in both a narrow and a broad sense. The author is evidently a strict constructionist, for he has confined his discussion to some of the instruments of fiscal control that are to be found in Massachusetts. The topics treated include limitation of debts and tax levies, supervision of debt payment, accounting and auditing, uniform statistics, certification of town and district notes, the special municipal finance commissions, local expenditures, and the supervision of local taxation. The handling of these subjects is adequate and interesting, except that there is, perhaps, an insufficient recognition of the nature and importance of the control of local tax collectors by the state tax commissioner.

Under a broader conception of fiscal control the experiment of the metropolitan district should be included. The formation of this district was one of the pioneer attempts in this country to solve, by functional reallocation, certain technical and financial problems that confront a group of municipalities comprising a great urban area. In view of the great interest in the reassignment of functions to more suitable jurisdictions, as a means of reducing costs and of more effective administration, it is unfortunate that the author did not include a chapter on this undertaking.

The results of the things that have been done are interesting and suggestive. Better procedures have been introduced at various points. A favorite contention of the rabid home-rule advocate is demolished, for it appears that the vigor and vitality of local government have flourished under central supervision, instead of being destroyed by it, as the opponents of such supervision allege will happen.

On the other hand, there have been some bad borrowing practices despite supervision, and local expenditures have increased seriously. The author does not explore all the causes of these conditions. It would have been most helpful had he been able to throw light on the question of the degree to which the prevalent structural and functional pattern of local government has been responsible. Was the expenditure increase a product of maladjustment of the existing local jurisdictions to their functional responsibilities? Did they abuse local credit as the only means of carrying the load? Could expenditure and debt increases have been more effectively restrained had there been elsewhere

in the state the kind of functional readjustment that was established in the metropolitan district? Questions of this sort call for answers, and those who study local finances should strive to provide them.

One minor but unfortunate matter of style must be mentioned. The author has the bad habit of beginning paragraphs with the word "now." Sixteen instances of this fault occur between pages 77 and 161, inclusive. Otherwise the exposition is clear and direct.

H. L. Lutz

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Forest Taxation in the United States. By Fred Rogers Fairchild and Associates. Washington: U.S. Department of Agriculture, 1935. (Miscellaneous Publication No. 218.) Pp. 681. $0.75.

Students of forest taxation who have been awaiting the final report of the Forest Taxation Inquiry, and who have used the several progress reports issued, will welcome this volume. Authorized in 1924, it has been long in preparation; but the time has been well spent.

On the theory that forest taxation is but one phase of a much larger problem, the staff has left no stone unturned in its search for facts; and it has not been deterred by the fact that many of the stones have been often turned before. This is especially true of the treatment of the assessment, apportionment, collection, and delinquency aspects of the general property tax. To this tax, which is given its customary criticism, most of the attention is devoted. So much so that but for it there need have been no Forest Taxation Inquiry.

The property tax, levied on capital value, is found to discourage forestation activities. Forestry is a deferred-yield industry and hence a capital-value tax takes a larger portion of the yield than would be the case if the same return were received on a sustained-yield basis. This excess is the principal feature requiring a remedy; and three alternative adjustments are recommended to effect its elimination in a confessedly rough but assertedly simple and practical manner. Neither the simplicity nor the practicality seems obvious. Another desideratum—namely, payment of the tax simultaneously with the receipt of the income, such as might in part be effected by means of a yield tax—was reluctantly rejected as not being fiscally workable in view of local governmental needs and incapacities.

The excess tax paid on forest property, by reason of the deferred-yield characteristics of forestry, is regarded as interfering with the

apportionment of the factors of production as between forestry and other uses, to the discouragement of forestry. Relief from this excess, as recommended, should rectify the artificial equilibrium, which is all the more serious in view of the undoubted public interest in the maintenance of a vegetative cover of many and large areas wherever it is feasible to do so.

Such relief would obviously, according to the analysis presented, result in increasing the capital value of present forest-property owners; and the resultant tax-revenue deficit would have to be borne by others. Is this an objectionable subsidy to present owners or is it a merited relief from a long-practiced unfair discrimination? It is repeatedly protested, too much it almost seems, that no subsidy to forestry is intended. Even as a subsidy unearned by present owners it might be tolerated if the predicted salutary effects on forestry could be assured. The reviewer does not fully share the faith explicit in the report that such will be the case.

It is fair to say that the report does not hold out the three recommended alternatives as a panacea even when supplemented by other tax recommendations offered; and the prospect of future forestry, as they see it, is dark. In the mind of the reviewer it is darker still. There is little ground for hoping that either tax relief or any other measure likely to be accepted will induce private owners to engage in socially advantageous forestation behavior.

JENS P. JENSEN

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Report of the New York State Commission on State Aid to Municipal Subdivisions: Legislative Document No. 58 (1936). Albany, 1936. Pp. xviii+357.

This *Report* consists mainly of a historical, legal, and statistical analysis of the system of grants-in-aid and shared taxes in New York State. Certain fairly well-recognized conditions have again been illustrated: the lack of relevant data in part due to the sad state of local records; the uncorrelated nature of the various forms of aid; the inadequacy of the small school district; the tendency toward the perpetuation of this system by the present methods of apportioning school subventions; the inefficiency of the town highway unit, whose functions have been almost entirely absorbed by the state and counties, but

which is retained for political reasons; and the relatively slight use made of state administrative controls in contradistinction to mandatory legal requirements, despite the ample grant of powers to the state authorities. The data seem to show that the various aids (especially the shared taxes) operate in rather arbitrary fashion, not merely under different circumstances but even under rather similar conditions.

Some of the conclusions reached are of more than local or transitory interest. The technical staff points out that the proper area for tax collection need not coincide with the units deemed appropriate for spending functions, although several of the commissioners believe that separation of taxing and spending functions is inevitably conducive to waste. If the desirability of centrally collected and progressive taxation be assumed, the alternatives appear to be shared taxes, grants-in-aid, or outright assumption by the state of spending functions previously assigned to local authorities. Commission and staff agree that tax-sharing has not been satisfactory, because local revenues from state sources fluctuate sharply, the amounts received are often small and bear little relation to needs, and the apportionment formulas do not measure local contribution or need. Accordingly, they recommend their discontinuance except for the motor tax shares, which are in effect grants-in-aid derived from earmarked revenues. Considerable doubt is expressed about the desirability of state assumption of the present local functions, since in some instances at least county administration appears more economical, while remote state control might result in bureaucratic waste. The net conclusion then, is, that grants-in-aid offer the most practicable solution of the problem, but that extension of central administrative supervision is a necessary corollary—a conclusion to which, however, several of the commissioners enter a vigorous dissent.

Conclusions about problems of the sort investigated here cannot be derived from mere data, but must rest on judgment compounded of inference and preconception. Hence the disagreements of the commissioners among themselves and with the findings of the technical staff. A more thorough statement of the broader issues of the subvention system would have made this report of more than casual interest, since other states sooner or later will face the same problems that New York now does.

HENRY J. BITTERMANN

Ohio State University

American Economic Progress. By HARRISON B. FAGAN. Chicago: J. B. Lippincott Co., 1935. Pp. ix+591. $3.50.

The author sets out with the thesis that economic history should provide a description and explanation of the economic life of the nation, that it should show the relation between economic affairs and social and political life, and that it should show the relative changes during the process of economic and social evolution. On the whole the book is adequate in the achievement of these purposes. Description and interpretation are woven into the text in such a manner that the two features give an acceptable running account of the development over the period of history covered by this volume.

This book is divided into three major sections: The author calls Part I "The Setting." Herein are discussed such matters as the conception of economic progress, the European background of American history, certain geographical features which have affected American development, and the beginning of colonial immigration. In Part II the student will find the familiar matter relating to colonial life and industries. Part III is concerned with what the author calls the "National Period." Here he discusses the leading lines of American economic activity, such as farming, manufacture, transportation, the development of financial institutions, mining and quarrying, etc.

The mechanics of the book make for easy handling in the classroom. Chapters are relatively short and only the essential facts are presented; and this means that troublesome detail is reduced to a minimum. The chapters are supplied with selected readings. Obviously, treatment in this manner requires rather extensive supplementary material because the author does not deal to any great extent with national policy with respect to the great issues. The matter of periodic division of historical material presents almost impossible problems. Professor Fagan has adopted the political, rather than the economic, classification, and divides his material into the "colonial" and "national" periods. Whether economic periods are clearly discernible is still a debatable question, and until this matter is settled the easiest taxonomy is in political epochs as the author has done.

Professor Fagan has woven together description and interpretation without committing himself to points of view. The reviewer is inclined to believe, however, that the author is inclined to the philosophical, rather than the factual, approach—an impression which is gleaned particularly from the handling of the last two chapters, namely, "Prog-

ress in Living Conditions" and "Social Control." This, however, is not a handicap for a college text provided the student is trained to check philosophy with reality. Such an exercise is wholesome, especially for the type of student who loves generalizations and who loathes the detail that makes the generalization worthy of belief. All in all Professor Fagan's volume is a useful contribution to the present assortment of college texts.

I. LIPPINCOTT

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Railway and Highway Transportation Abroad. By W. RODNEY LONG. Washington: Bureau of Foreign and Domestic Commerce, U.S. Department of Commerce, 1935. Pp. viii+426. $0.50.

This report is the result of a study made by the Transportation Division of the Bureau for the President's Transportation Committee formed in 1933. The study deals with "existing conditions, recent competitive measures, and co-ordination policies," in foreign transportation. The book is a very convenient reference source on foreign transportation legislation and efforts toward co-ordination, and should throw considerable light on our own transportation problems. It is regrettable, however, that the many valuable discussions of co-ordination which have appeared in scientific and specialized sources were not drawn upon in the compilation of the report.

HERBERT E. DOUGALL

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